A Study on Socio- Spatial Features of Carfree Streets～Space, Mobility, and Community

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カーフリー街路の社会空間的特性に関する研究 ～空間、移動性、そしてコミュニティの 関連から

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Abstract

This thesis evaluates the use of spaces reclaimed from cars by conceptualising car-free streets as community urban open spaces. The results are presented in five major studies. Firstly, based on data from 399 questionnaires and interviews with 6 key stakeholders in Nairobi Kenya, the study investigates perceived safety, comfort, and connectivity of users across three street types: a typical car street, a one-way street, and a car-free street. Secondly, the study exposes the underlying relationships between residents' attributes and the use of nearby shopping streets based on a survey of 256 residents living in the vicinities of two shopping streets in Tokyo. Thirdly, through direct observation and mapping, the study explores the occurrence and nature of stay activities such as standing, sitting, and children's play during car-free hours. In the fourth study, participant observations during car-free events and in-depth interviews with fourteen leaders demonstrate the attitudes that undermine car-free street activities, and the underlying conflicts in organizing and managing them. Lastly, results of a quantitative analysis of resident's views in three neighbourhoods show the relationship among aspects of car mobility, perceptions of street space, and the influence of community involvement in activities done on car-free streets. When the results are discussed under a framework of "production of space" by Henri Lefebvre, it is clear that current efforts have been inconsistent with the needs of people using street space while people's perception of streets is largely limited to movement of goods and people. The effect of elaborate events on day-to-day life also remains minimal. Gradually, the rigidity of government agencies and the domination by automobiles has relegated local residents into mere consumers of the street space offered to them.

Keywords: Car-free, Automobiles, Streets, Community, Mobility

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Preface

I have always been fascinated by urban life, the pragmatics of dos and don'ts, and the unwritten poetics of lived reality. This curiosity brought me to Japan, and the thirst is yet to be quenched. I am still charmed by the narrow streets and the settled patience of drivers in them, the intimacy of shitamachi and the silence of the beings inhabiting them; yet this fairy tale has not been spared by the invading automobiles. The sheer awareness of the possibility of a neighbour reversing his car onto the street, the fear of taxis plowing through a shotengai, or the acute caution at the back of every mother's mind when children play outside have all suppressed the joy of walking and greeting, stopping and talking.

Streets cumulatively constitute the biggest city public space, but the power plays in urban relations of mobility tend to favour the automobile. State agencies assert this automobile dominance of automobiles through prioritisation of infrastructure, acts of parliament, while affairs of pedestrians take a back seat. Children who would bring toys from the house to play outside have to move to designated spaces such as parks that are run by the rules of city officials. Faced with the intimidating power of the automobile, the majority in the urban citizenry are gradually surrendering their liberties of enjoying a public resource.

Indeed, motorised transport has brought gigantic transformations to economies, socialisation patterns, and the physical environment. Increased mobility has enabled the fulfilment of people's aspirations for work, knowledge, shopping, and leisure, but the resultant dispersion has reduced the significance of the local street as a community platform. The paragraphs in this thesis narrate a myriad of attempts at emancipating streets from the shackles of automobile dependence while highlighting what has been done with the reclaimed space. The thesis argues for the consideration of streets as open spaces for people to self-express by not only walking but also for conversations, for children play, and for communal meals. It is my hope that this work will awaken our understanding of street spaces beyond the constrictions embedded in institutional conceptions of safety and orderliness.

Chapter 1: Introduction

People do not use city open space because it is there and because city planners or designers wish they would-Jane Jacobs (1961, p.117)

1.0 Introduction

In the quote above, Jane Jacobs mourned the thinking among city planners and designers who conceptualised open spaces as physical elements detached from the lived reality of space users. The failures of car-oriented schemes and later, the failure of many carfree schemes has been the disregard for the ideals of people who use the resultant spaces. Bernard Rudofsky (1969) also observed that "restructuring a motorised street for people extends beyond the physical changes on the streets such as paving and trees into the harmony of the space with social activities and the physical surroundings." This comment reflects his prolonged critique of the fancy yet unsound initiatives that attempted to reduce the nuisance of cars in neighbourhood streets through physical alterations that did not address the socio-cultural and economic nuances of every setting. Cars, as technological advancements enabling more efficient mobilities have many advantages to the functioning of society, but neighbourhood streets as communal spaces for residents and local business owners have a carrying capacity which when exceeded leads to decay of the community fabric; consequent policies seeking to better the flow of cars without attention to the particularities of the neighbourhoods disenfranchise communities and escalate the prevailing challenges (Jacobs, 1961).

Contestations between human activity and non-human elements have been part of intellectual discourses for centuries. Whereas man has invented technologies in urban areas to ease life by improving the efficiency of day to day undertakings such as

travelling, communication, and manufacturing of goods, many of these technologies have turned back to bite man through irritations such as noise, accumulation of waste, and diseases. There is therefore a great need for society to stop yielding to technology as if a master but to see technology as serving humans, a tool to be adored only within the extents of its betterment of human lives (Crawford, 2000).

When left unchecked, the quality of life and liveability promised by new technologies becomes short-lived as new concerns arise; the cycle of inventions and more inventions to cover up for nuisances from the former raises pertinent questions of sustainability and resilience of prevailing approaches. To Martin Heidegger the essence of technology is not in conceptions of what is "technological" an approach that sees technology as a neutral thing; it is neither a mere "means to an end" nor a mere "human activity" rather a combination of both in a gradual process of "revealing" or "unconcealement" whereby man is challenged or called forth to bring the modes of "revealing" allotted to him for "ordering things" in an already in-progress "revealing" of reality (Heidegger, 1977). Thus, discourses on carfree streets need to stretch from "the car" as a technology and incorporate the social processes leading to "the car" and its implications on the production of social space in urban areas.

Most cities were carfree just a century ago. While the dominance of the car has brought many challenges in cities across the globe, the interaction of the car and humans are inextricably interwoven in a mesh of space and time dimensions whose socio-cultural implications cannot be solved through additional engineering solutions. Car use reveals sets of social and mobility patterns that existed in society long before the car technology

arrived; an understanding of these intricacies in light of the car as an intervention will be critical in solving problems of automobile dominance. As Crawford (2000) argues, "while many problems with cars are of a technical nature and therefore susceptible to engineering solutions, the most serious problems are intrinsic and cannot be solved by any application of technology." (p. 29). Leaving issues of mobility in neighbourhoods at the whims of experts who isolate the materiality of cars and the streets they use from the social space they operate will only serve to fulfil the rationality of institutional decision makers while continuing to alienate people from the spaces they encounter in their day-to-day lived experience. Amin (2008) decries this isolation as shown in the quote below:

> "…technology, things, infrastructure, matter in general, should be seen as intrinsic elements of human being, part and parcel of the urban 'social', rather than as a domain apart with negligible or extrinsic influence on the modes of being human. Accordingly, the formative sites of urban public culture—collective forms of being human through shared practices—need not be restricted to those with a purely human/inter-human character, but should also include other inputs such as space, technological intermediaries, objects, nature and so on…" (p.8)

Many studies have demonstrated that streets are crucial urban open spaces for the prosperity of cities in addition to being mobility channels for moving people and goods; their effectiveness is thus pegged on a proper reflection of the ideals of the city dwellers (Gleave, 2010**;** Mehta 2007; Gehl and Gemzoe 2004; A. Jacobs 1993; Appleyard 1980; Whyte 1980; J. Jacobs 1961). Carmona, Heath, and Tiesdel (2003) also posit that urban design needs to focus on how people use and colonize space. For example, although

Japan embraces liberal democracy and is one of the richest countries in the world, Shibata (2007) notes that most decision makers and academics in urban planning have tended to disregard public interest except during the social movements in the 1970s. Traditionally, in the absence of designated spaces such as parks and plazas in Japan, streets were primarily open spaces while mobility was secondary; they were multifunctional extensions of living areas separated by time and were utilized as communal spaces for trade and for family undertakings (Shi, Jia, & Wee, 2015; Mateo-babiano, 2005; Shelton, 1999; Bognar, 1985). Unfortunately, as cars increase, the traditional role of streets as a communication platform in neighbourhoods is being lost. Although hundreds of streets across Tokyo have carfree hours in evenings and on weekends, utilization of the reclaimed space for stay activities such as children's play has been on the decline.

1.1 Background to the study

The automobile is undoubtedly the object that has been most prominent and universal in transforming the cities of the world after the industrial revolution (Gartman,1994; Crawford; 2000, Newman & Waldron, 2012). Increasing dependence on the automobile in cities has been the cause of many problems such as breakdown in human interactions, environmental pollution, worsening urban aesthetics, and urban sprawl; automobiles are also not energy-efficient, are very space-intensive, and expensive (Davalos, Maldonado, & Polit, 2016; Crawford, 2000; Khisty & Ayvalik, 2003). As Marshall (2014) posits, cars have tremendous negation on the environment; they create a huge ecological footprint towards their manufacture, cause pollution in their lifetime, take up space, and finally cause pollution in their death through decaying parts.

As the world attempts to achieve the Sustainable Development Goals (SDGs) by 2030, there is a need to re-examine people's relationship with spaces used by cars. Unfortunately, there are no major signs towards extinction of automobiles in the near future; they will continue to be key in the movement of goods and people in urban areas in addition to other modes of transport such as trains and walking. However, issues of air pollution, congestion as well as secondary effects such as crime continue to dominate current scholarly works. There is a general agreement that use of automobiles has had many negative effects in the functioning and aesthetics of urban areas. What remains is to look for sustainable ways of either co-existing with automobiles or varying the extents of their usage. Many carfree schemes have risen to this challenge. Initiatives such as carfree housing developments and temporary carfree shopping streets have sought to limit the access of automobiles for reasons such as enhancing safety.

Ultimately, it is not sufficient to stop cars; the use of the resultant space is critical. For neighbourhoods, the ability of the local community to utilise carfree street space for stay activities such as children play is important. To Appleyard (1978), streets in residential neighbourhoods are effective if they have the following seven components: street as a safe sanctuary, street as a liveable, healthy environment; the street as a community, street as a neighbourly territory, street as a place for learning and play, street as a green and pleasant land, and street as a unique historical place. For shopping areas, when there is no fear of cars, a relaxed and enjoyable environment emerges, one that offers the ability to move freely and interact with others.

1.1.2. Tracing the interaction of cars and streets

The first steam-powered vehicle dates to 1769 from experiments by Nicolas Cugnot of the French Military whose invention, a tractor moving at 4km/hr was used to move artillery and later, a steam-powered tri-cycle carrying four passengers (Cheshire, 2009; Dutton, 2006). Efficiency and elegance were improved continually until the invention of a practical internal combustion engine attributed to Gottlieb Daimler patented in 1885, a prototype to today`s car and on to 1913 when Ford and other American manufacturers were able to produce cheap cars affordable to the general population after the cancellation of a controversial patent bestowed on George Selden (Dutton, 2006). Meanwhile, Gartman (1994), opines that this was not only a transformation in mass production of cheaper cars but also mass consumerism that produced a new symbol of capitalism, and later, addiction and dependence on the same tools.

One of the key reasons for increasing discourses on auto-restriction is to reduce automobile congestion; it has gained prominence partly due to the observable consequences compared to other menaces (such as public health and aesthetics), and the subsequent inconveniences such as delays. However, depending on the location, the immediate menaces associated with automobiles vary: residential neighbourhoods are plagued by speeding, noise, accidents, high traffic volume and other menaces specific to through traffic (Pojani; 2007); challenges of declining urban oeuvre (historic districts), and pedestrians` accessibility (in commercial streets) are prevalent in Centrals Business Districts. Patel, Gandhi, & Bhatt, 2016 note that carfree cities are driven by the need for (1) High standard quality of life, (2) Efficient and sustainable use of resources, (3) Faster transport of people and goods; and (4) Design Standards. Auto-restriction has also been

shown to be a direct enhancer of business with shops in pedestrianised streets performing better than others situated in similar locations with car traffic when the schemes are objectively chosen based on variables such as noise, amenities, and accidents (Whelan, 1994).

Meanwhile, current attitudes towards automobiles lean towards allowing unhindered ownership of, and access by vehicles while illegalising stay activities. With rising incomes and greater import-liberalization for used cars, automobiles are rapidly increasing in most developing countries (United Nations Human Settlements Programme, Un-Habitat, 2016). On the other hand, even though their developed counterparts have initiated programs to tackle automobile dominance, most of the programs are aimed at objective aspects such as pollution and safety while more subjective aspects such as community wellbeing remain on the sidelines. When articulating issues of urban mobility, most governments have emphasised on order and revenues such as from parking charges while the business community is keen on profits hence focusing on clients' convenience and ease of bringing supplies. Although scholars such as Khisty & Ayvalik (2003) have noted that the situation is more alarming in developing countries, only a small part of this research (such as Dokmeci, Altunbas & Yazgi, 2007) touches on developing countries. The images of automobile life with its (convenience, beauty, and comfort) associations are addictive. Coupled with the indignities of chaotic public transport in many developing countries, both the upper and lower classes are engulfed by the fascination of the empowerment that comes with car ownership.

Even though there are proven benefits of car restrictions , there are also some negative effects that follow car restrictions. As Rahman, Kubota, & Sakamoto (2007) note, the benefits of limiting traffic are easily identified but the limitations may be more unexpected. For cities aspiring to forge car-restriction measures, queries such as those regarding the extents of exemptions, the administrative competency in implementation, and political sensitivity are critical (Topp & Pharoah, 1994). Shiftan, Shefer & Avraham (2002) warn that measures in city centres can bring the reverse effects such as encouraging people to travel to other destinations, change or cancel activities, or even dispersal of businesses that revert people to their initial auto dependence. To Topp & Pharoah (1994) these negative effects may include an enhanced business environment that leads to increased rents and ultimately, a displacement of weaker retailers by stronger ones.

1.2 The Conceptual Framework

This section presents a theoretical-based conceptual framework about perceptions and conceptions of carfree streets and the activities thereon in relation to automobiles. This is done by theorising carfree streets as public open spaces for stationary activities in response to the ideals of local residents. The problem of car invasion is discussed as a contestation between individual priorities and communal goals, and the needs of local residents against the priorities of government agencies. The liberty and ability for an optimal appropriation of street spaces is viewed as an enhancement to public welfare and quality of life. Essential ideas of Henri Lefebvre's theory of Production of Space are briefly outlined and related to utilisation of urban streets. Other theoretical concepts are

used to expound on key elements in the interaction of people with the physical and social environment.

1.2.1 Capitalism`s exchange value against the reality of daily life

In the production of space published in French in 1974, Henri Lefebvre (1991) argued that while social space generally contains and assigns suitable platforms for various activities, it is by its own nature full of contestations and contradictions; the state and its tools of power rationalises aspects of this reality and establishes systems for utilisation of the urban space while offering people an illusory homogenous space that they consume, and are part of. This restricts people's ability to model their surroundings to satisfy their daily needs.

Capitalism and the rationalised models that support it often emphasise the monetarily commensurable aspects of development such as trade and transportation infrastructure while ignoring peoples' lived reality evident in their day-to-day relations with their surroundings. Relations of competitiveness embedded in the exchange of goods and services are often elevated above essential elements of social reproduction. Traditionally multi-functional spaces such as streets are thus conceived as homogenous products that allow for certain behaviour while sidelining others. With such a view, government agencies insist on "orderliness" while business owners focus on the profitability that comes with easy and cheap movement of goods and customers. This thesis, however, presupposes that the street is not a mere mobility channel; with well-thought car restrictions, it is an open space that can be appropriated for pedestrian movement as well as various stay activities such as children's play.

In the Right to the City published in French in 1968, Lefebvre (1996) expounds on the role of the state in maintaining the illusion of harmony, the developers maintaining the exchange value of products and space, while thoughts about the lived reality and beauty of the oeuvre only remained with a small group of scholars and artists. This small group may positively help in the retention and celebration of the city, or may inject functionalism and systems that destroy the fluidity of the oeuvre. Certainly, conflicts in the utilisation of space are not perfectly quelled by the state: conflicts among user groups, classes, and their objectives continue. Jacobs (1961) notes that the frequent complaining of a contestation between the automobile and pedestrians is essentially a contestation between the automobile and the city. To Harvey (2008), aspirations for remaking the city are largely a reflection of people's daily life desires regarding issues such as social relations, relations to nature, and aesthetic value; the right to the city thus includes people's rights to change themselves by changing the city to their own desire.

1.2.2 Dimensions of (social) Space

In general, the development of epistemology on space has tended to take two extremes: objective measures one end and subjective measures on the other. Lefebvre sought to express the importance of the subjective existential sense of space above the objective naturalistic perspective and to elevate the value of space in daily experience beyond its constrictions in physicality and people's cognitive capabilities (Lefebvre, 1991,33,38). In the same vein, Edward Soja (1996) contrived the notion of a thirdspace by building on a firstspace that focused on the "real" material world and a secondspace that interpreted this reality through "imagined" representations of spatiality.

Many studies have shown the influence of the physical environment of the street on people's experiences. For example, narrow buildings emphasise verticality and produce the illusion of short streets; narrow buildings also add interest on the street since they have more doors and increase variety along the street (Gehl and Gemzoe, 2004); the presence of niches also attracts stay activities in open spaces (Gehl, 2011). Some studies have demonstrated the effects of store facades on behaviours on streets (Lee & Yoon, 2015; Mehta, 2007). Others have also stressed the importance of the subjective measurements of people's experiences on streets. For example, Jane Jacobs' concept of "eyes on the street" addressed the presence of adults on streets as a key point for children playing as compared to parks where children play by themselves (Jacobs, 1961).

Henri Lefebvre offers a superb framework to address these issues. Lefebvre argued that space goes beyond the cartesian dimensions of mathematicians such as Descartes and Newton that concentrated on the relation of objects; humans are part of space and are also defined by space. To illustrate this, Lefebvre sought to distinguish between three aspects of space: 1. Spatial practice deals with perceived space as people engage in various activities, 2. Representative space is the space that is mentally conceived, while 3, Representational space is the lived space, the reality of experiencing daily life. To him, society is always producing space, a space of contradictions and competing interests, but the state and its instruments of power emphasise on an illusionary conceived space where differences seem to be planed, a space where certain objectives can be pursued and not others. Lefebvre continues to explain that abstract space guided by the state power exalts representations of space (conceptions of space) at the expense of representational spaces (the lived reality).

In sum, when conceptualising the influence of cars in neighbourhood streets, there is a need to transcend the rationale of viewing people, street elements and cars as physical objects interacting on a cartesian urban space, but rather to infuse this with the day-to-day experiences of the people, their influence on the physical space, and the influence of the physical space on people in the context of mobility.

1.2.3 Possibilities for a paradigm shift in automobility

Mobility encompasses the act of movement, what is being moved, as well as the mode of movement. The interaction among various modes as well as with static elements elicits many contestations and power plays in urban public spaces. To Sheller and Urry (2000), automobiles are not innocent machines that permit patterns of social life that could have happened regardless; on the contrary, they have been serious agents in transforming "time-space scapes" by necessitating mobility patterns that seek to fulfil objectives that were enticed and triggered by their availability. The car has become a tool for expressing the liberty to execute daily life according to individual objectives and desires; the car as a capsule and the spaces it colonises produce an alternative way of belonging and of celebrating urban citizenship and the democracy therein (Urry, 2004).

Technology depends on the attitudes and ethics of its users. Moore (1966) for example observes that technology is created by man and therefore it should not be allowed to destroy its creator. However, in what Urry (2004) calls "systemic domination" the enslaving convenience of automobiles is ever increasing, and there is no visible change in their dominance over other elements of urban areas. Possibilities for a paradigm shift

in the role of cars in urban societies lies on either linear models based on gradual changes or unexpected sudden shifts in the future.

The coming of a carfree age may be looked at in delight by many, but current progressions in car usage offer little hope towards a return to an amiable countryside environment. The current descriptions of this utopia are wrapped around miniature districts and compact cities, and rarely offer insights into tactics to solve the challenges in existing cities. The increased doting towards the car in developing countries, and the insistence to stick to cars in the developed world is disheartening. Conservative models such as expansion of infrastructure to car-related problems do little towards long-term change. Aspirations for dedicating carfree streets are not to be viewed as utopic destinations where contestations come to a halt. Rather should be a celebration of the day-to-day heterogeneity and conflicts in space.

Unfortunately, Harvey (2008) observes that although there is growing interest in people's rights regarding urban issues, a collective turn is often occasioned by special circumstances burdening a citizenry. This asserts the importance of conflict in arousing change instead of pursuing a homogenous street space. To Moore (1966) when viewed positively, conflict is an opportunity to challenge social structures by a few people keen on appropriating their surroundings past existing social norms. He makes the following observation:

Some of these reshapers of man's destiny are honorable troublemakers in the context in which they find themselves: scientists and engineers, teachers and legislators, social planners and community developers. Others are faced with opposition from constituted authorities, and from the network of traditional restraints that discourage innovation.

The first target of the malcontents in those situations is precisely the established social order, which is regarded as inhibiting if not iniquitous. (p. *765*).

In the theory of the Tragedy of the Commons, Garett Hardin explained how communal resources are ruined by the cumulative innocent objectives of individuals whereas it is difficult and costly to exclude potential users; the rational behaviour of individuals that seeks to maximise the benefits they get from communal resources causes eventual harm on the environment, to others, and even to themselves (Ostrom,2008; De Young, 1999). The continued use of automobiles is a consequence of people seeking greater convenience but the cumulative effect of automobile dominance in neighbourhoods has reduced safety, social relations, and aesthetics to both car owners and non-car owners. Ostrom (2008) observes that while there is a potential for users to self-organise in order to regulate the extraction of the resource for public good, rational solutions by authorities to solve the tragedy of commons have had other negative effects.

1.3 Objectives of the study

This study seeks to bridge a gap between existing knowledge on the relationship between automobiles with people and the successes and potential of carfree schemes. By injecting a community perspective into the discourse, the study emphasises on the implications of carfree conditions on the reality of daily life in contrast to the objective measures that have been based on aspects such as traffic direction and speed. The study seeks to create an understanding of street environments from objective observations and subjective experiences, as well as interpretations of people's perceptions and consciousness. To realise this, four general objectives are pursued.

I. To describe the nature of stay activities on carfree streets

II. To establish challenges in people's attempts to utilise adjacent street space

III. To establish how residents perceive street spaces with regard to cars and street activities

IV. To determine the relationship between governments priorities and people's lived reality in the use of street space

The specific objectives are pursued with greater detail in separate studies in succeeding chapters

1.4 Combination of methods

In order to obtain a holistic understanding of the relations between mobility, space, and community in carfree environments, Case Study Research was used. Streets with a history of stay activities in neighbourhoods were selected. As Yin (2014) observes, one of the most superior advantages of case study research is its closeness to real-life situations; by intensively undertaking participant observation and investigating particular streets and their surroundings, it is easy to collaborate the day-to-day realities of people and the scientific data results. Case study research also gives a more nuanced view of reality (Flyvbjerg, 2006) enabling this study to offer insightful contributions to the existing literature on the interaction of mobility, space, and community in carfree streets.

This study utilises a mixed-methods approach consisting of direct observation as well as interviews and questionnaire surveys (table 1.1). In terms of the target subjects, the studies with the observed reality of street users, the underlying factors through the experience of leaders, and finally, the views of local residents including those who do not participate and those with opposing views.

Entrikin (1999) observes that to understand space, we need to have access to both subjective and objective views of reality. The study relies on observation techniques to describe the reality in the occurrence of street activities in carfree spaces, exposes the underlying challenges through interviews, and then discusses the implications of governments' abstract space on people's lived reality on the streets. Investigations in Japan are based on three instances: weekdays with cars, ordinary carfree weekends, and carfree setups with organised activities such as playstreet and concerts. In Kenya, the study focuses on three street types: typical car streets, one-way streets, and carfree streets. Through literature review, the study traces current and past people-centred streets, invasion of automobiles in urban areas, the consequent side-lining of pedestrians and stationary activities, as well as current efforts at emancipating streets from automobile dominance.

Table 1. 1: Combination of methods

Objective	Methods	Subjects	Type of information	Type of data
To describe observed reality of street participants and passers-by	Direct observation	• Children playing • Parents • Organisers/managers • Passers-by • Buyers/sellers	Primary information of how people behave	Quantitative/ Qualitative
To establish underlying factors determining use of streets	Structured Interviews	• Play leaders • Volunteers • Street Researchers • Machizukuri leaders • Shotengai leaders	Primary information on people's relation with the space	Qualitative
To establish implications of carfree streets on local residents	Questionnaire Surveys	• Residents • Shop owners	Cultural attitudes and processes of organising street activities	Quantitative

1.5 Research flow

Lefebvre (1996) posits that in the search for knowledge, in order to be able to move from the abstract to the concrete, from theory to practice, three steps are critical: 1, Description

of the reality based on experience and a general theory, 2., analysis of the described reality while trying to compare, and 3., the study of the modifications and evolution of above structures to return to the present. This thesis first describes the current situation through casual participant observations and literature reviews and case studies of various carfree models, undertakes empirical studies to test assumptions made in the first step, and finally links empirical evidence to the evolution of people-car contestations. Nevertheless, the results of quantitative analysis necessitated further literature reviews and interviews in order to better understand the implications of the findings.

The flow of the study begins with an introduction to the problem and an analysis of previous studies regarding automobile use, history, various carfree models, stay activities on the streets, and various theories helpful in addressing the problem. Before framing the contents and methods for the empirical studies, research questions were set and case studies selected. Thereafter a conclusive discussion of the results emerging from these studies was used to explain the implications of the results on the problem stated at the beginning (figure 1.1).

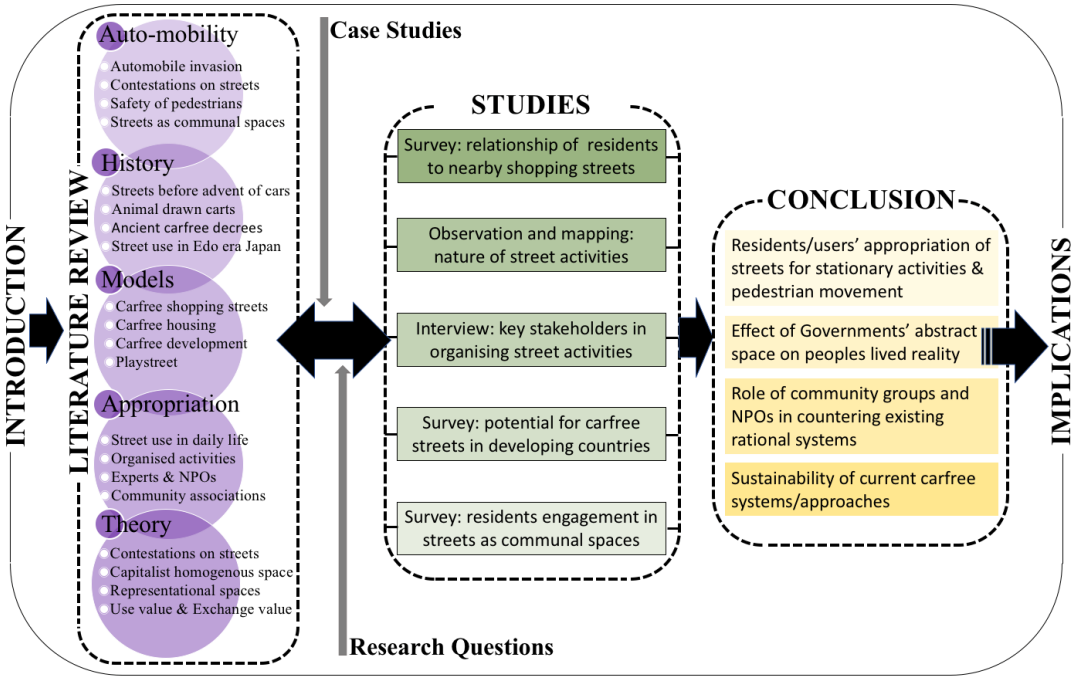

Figure 1. 1: Research flow

1.6 Summary of Chapters

Chapter 1: This chapter offers an introduction to the problem of automobile dominance, outlines the objectives of the study and its contribution to the prevailing body of knowledge. Common contestations in the use of street spaces are also outlined, negative effects of automobiles and recent efforts in restricting cars are also outlined. Theoretical arguments of that are useful in understanding the current situation are also discussed.

Chapter 2: Various models of carfree streets are explained in this chapter. These include intrinsic carfree cities such as Venice, Woonerfs and home zones as well as carfree housing projects. The chapter also discusses the history of people's relations with streets and cars, various initiatives at emancipating streets from automobile

domination across the globe, and the challenges therein. Special attention is also paid on the status of automobiles in developing countries such as Kenya.

Chapter 3: An overview of the process of collecting empirical data for this thesis as regards the data collection methods, processes of analysing different measures of the dependent and independent variables as well as the planning and necessary adjustments that informed the final layout of the results is presented in this chapter. A brief description of the foundational philosophical concepts that have advised the selection of methods and tools is also offered.

Chapter 4: Although most of the studies in this thesis are based upon Japan, a hyper-industrialised country, it became necessary to undertake studies in less developed countries in order to depict the foundations of automobile dominance. Chapter 2 is thus case study of Nairobi, Kenya that shows people's perceptions of elements of comfort, safety, and convenience in developing countries. The discussion is based on a normal car-street with a lot of vehicular traffic, a one-way street, and a carfree street.

Chapter 5: Based on two shopping streets in Tokyo, this chapter attempts to understand the significance of carfree shopping streets to local communities, the alternatives that are reducing the significance of these streets, and the value of carfree shopping streets as places of communication.

Chapter 6: In this chapter, an attempt is made to map the occurrence of stationary activities such as standing, sitting, and children's play. Based on two streets in

Tokyo, an analysis of the differences across three scenarios: ordinary days with cars, ordinary carfree Sundays, and carfree Sundays with organised activities is done. Other influences of stay activities are also discussed

Chapter 7: Structured interviews and participant observations are utilised to explain the underlying issues contributing to the under-use of street spaces reclaimed from cars. Based on the author's participation in street activities for two years, a qualitative study was undertaken to show various activities such as children's play on carfree streets and how this influences perception of streets as urban open spaces. Structured interviews with key organisers exposed the challenges in conceptualising streets as platforms for stationary activities, the rationality of government agencies and the role of residents.

Chapter 8: This is a quantitative analysis of residents' perceptions on aspects of mobility, space, and community with regard to carfree street spaces. Key variables likely to influence the success of carfree street activities (derived from literature review, observations, and interviews in previous chapters) are tested on residents in the surroundings of four streets in Tokyo through a survey. ordinal scale of five levels is used to rank answers to 17 questions regarding perceptions towards stay activities, safety and comfort.

Chapter 9: This chapter offers a brief discussion of the implications of the results from previous chapters under a framework of Henri Lefebvre's Production of space. The role of government agencies, business owners, and communities in sterilisation of

street space is discussed in reference to carfree streets. Recommendations on the adaptation of these results are also offered in this chapter.

Chapter 2: Literature Review and Case Studies

2.0 Introduction to previous studies

Many studies have attempted to evaluate the influence of cars in society. Some of the studies have focused on the negative effects of cars (see Marshall, 2014, Ogendi, Odero, Mitullah & Khayesi, 2013; Hart & Parkhust, 2011), some have focused on various initiatives at reducing car dominance (see Melia & Shergold, 2016, Crawford, 2000) while a few have focused on stay activities on carfree streets (see Mehta 2007; Gehl and Gemzoe 2004). Nonetheless, most of these studies have concentrated on the situation in Europe and America, while little has been presented regarding other places such as African countries and Japan.

There is growing awareness on the need to rethink car dependence since unrestricted and indiscriminate use of automobiles has been fundamental in jeopardising the general quality of the living environment, and the safe and comfortable use of streets by city residents (Buissink, 1977; Kawada, Kishimoto & Fukai, 2013; Parkhurst, 2003; Sheller & Urry, 2000; Iranmanesh, 2008). According to Couclelis (2000), discussions on accessibility fall into three major perspectives: spatial (spatio-temporal), functional, and the economics perspective; these three perspectives have differing influences on accessibility depending on place, individuals involved, and the transport system. Meanwhile, Yuen & Chor (1998) identify two competing schools of thought concerning car usage in urban areas: the first is pegged on the importance of cars to economic development and the personal freedom of car users to access roads and parking spaces; the second is concerned with limiting the use of cars in urban areas by direct prohibition, offering alternative modes of travel or a combination of both. Sheller and Urry (2000) however point to the irresistibility of automobiles because of the simultaneous flexibility

and coercion they create, a consequence of the time and space complexities their reliance produce.

2.1 Street functions and activities

Streets model the form, comfort, and order of communities far beyond facilitating the essential mobility and support infrastructure (Jacobs, 1993). Nevertheless, the use of streets as open spaces for outdoor activities is pegged on the quality of the open space rather than the mere availability (Jacobs, 1961; Gehl et al. 2006; Inoue et al., 2011).

Pedestrians largely occupied urban streets in the 19th century before the advent of cars that largely replaced pedestrians in the early and mid-20th century in Europe and America, and mid-20th century in Japan (Kwon, Morichi & Tetsuo, 1997). Compared to parks, shopping streets and market places reduce the sense of "being monitored" and allow people to enjoy being part of the public no matter the age, race or gender; they also allow for choices on whether to be alone or to interact with others (Cattell, Dines, Gesler, & Curtis, 2008). Pedestrianized streets in many cities were traditionally used as cultural and entertainment plazas where people met not only on ordinary days but also on holidays and festive seasons (Jacobs, 1961). In an age of urban sprawl, multiple usage of public space and proliferation of sites of political and cultural expression, it seems odd to expect public spaces to fulfil their traditional role as spaces of civic inculcation and political participation (Amin, 2008; 5).

Activities on streets are influenced by a variety of physical and social factors. There are many affordances that streets offer to people undertaking stay activities. People's attachment to streets is a factor of the physical environment (e.g. landscape features,

access, and legibility), activities therein (e.g. entertainment and presence of vendors), and the mental images that people have regarding the place (see Ja'afar, Sulaiman & Shamsuddin, 2018; Ujang, 2017). To Chen, Nakamura, and Kuma (2014) street affordances fall into categories of physical features, urban design features, and individual feelings. Gehl and Svarre (2013) advocate for five aspects in evaluating a space: How many people, who (for example men, women, and children), where, what the person is doing, and how long the activities take.

Users determine which elements are likely to satisfy them depending on their history and social backgrounds (Chen, Nakamura & Kuma, 2014). The quality of space also depends on the subjective perceptions that are particular to each street user. For example, Inoue et al (2011) observe that among Japanese elderly aged between 65-74 years, social environment and aesthetics are consistent correlates of both transportation walking and recreational walking; the specific issues of concern differed widely between men and women respondents. Particular to shopping, Erkip, (2005) observes that women tend to be more expressive in their shopping preferences more than men. The atmosphere of shopping areas thus becomes a critical factor.

Gehl (2011) categorizes outdoor activities in public spaces into three major categories: necessary activities such as shopping or waiting for a bus, 2. optional activities such as strolling or standing to enjoy life, and 3., Social activities such as children play, greetings, and conversations. Each of these activities has a corresponding set of physical elements that support it. The character of the physical environment is of little influence to the

necessary activities compared to optional activities; the social activities however depend on the presence of other people.

Mehta (2014) argues that the ability of a space to support activity and sociability and the resultant place attachment are key features of the meaningfulness of open spaces; he then continues to measure five aspects: 1. Inclusiveness (e.g. presence of people of diverse genders, race, and class, and the range of activities and behaviours) 2., Meaningful activities (e.g. variety of businesses on the edges and the availability of food within or on the edges of the space), 3., Comfort (e.g. shade, shelter, and places to sit without paying for goods or services) 4., Safety (e.g. openness to adjacent streets and safety from traffic), and 5., Pleasurability (e.g. presence of memorable landscape features). Other studies have also demonstrated the influence of business types in determining the atmosphere of a street (see Lee and Yoon, 2015).

Spaces with a variety of information e.g. an open feeling, signs, and merchandise correlate with slow walking speeds and are commonly attractive to pedestrians (Matsumoto et al., 2009). In the same breadth, Mansouri, Matsumoto, Aoki, and Sugiyama (2011) identify the sky, ground, buildings, vegetation and actors (such as people) as the five main classes within a streetscape visual array that influence users' perception of space. Additionally, Kwon et al. (1997) found that for narrow urban streets, the main influences are the distances from standing obstacles to the moving traffic modes, pedestrian walking position, car speed, and the interactions among traffic modes in mixed traffic conditions. The aesthetic significance of the combination of these elements if well evaluated in regard

to the street experience can provide an understanding about how to enhance the physical environment of the street.

2.2 Liveability of urban Streets

Liveability of urban streets regards how well a street caters to the needs of its users. Many studies have used walkability as a measure of liveability due to its environmental sustainability and promotion of physical health (Shamsuddin, Hassan, & Bilyamin, 2018; Wicramasinghe & Dissanayake, 2017). Azmi, Karim, & Amin (2012) characterized walkability based on aspects of walking behaviour: speed, direction, walking experience, group formation, and density. Pedestrian friendliness has also been used to measure livability (Rahman, Sakip, & Nayan, 2018). Streets are also liveable if they satisfy a user's feeling of safety, comfort and convenience, as well as access and connectivity (Rahman, Sakip, & Nayan, 2018; Zakaria & Ujang, 2015). Additionally, Jeong, Heo, & Jung (2015) note that intensity of shopping activities, traditional characteristics, and the sense of place attachment are key contributors of liveliness of streets.

Safety on streets is a measure of how much a street user is free from both real and subjective dangers based on factors such as the amount of vehicular traffic, presence of other street users, police security, and signs of vandalism (Rahman, Sakip, & Nayan, 2018). Presence of people may enhance the feeling of safety although overcrowding has negative impacts due to the possibility of pickpockets and sexual harassment; the extents differ between men and women (Rahman, Shamsuddin, Ghani, 2015). Sham, Omar, & Amat (2012) note that most women, 74.2 % reported encountering crime while walking to or from public transport points in Malaysia. According to Shokoohi, Hanif, & Dali

(2012), parents` judgment of children's safety depends on the number of other pedestrians on the street.

Comfort and convenience regard the pleasantness of a street regarding elements such as weather and climate, spaciousness, and support facilities (Rahman, Sakip, & Nayan, 2018). It is also influenced by the type of users especially the presence of students and tourists (Jalaladdini & Oktay, 2013).

Access and connectivity regard how well a street user is able to navigate smoothly through the street and effectively reach points of interest such as bus stops; the presence of obstacles and the directness of walkways are some of the determinants (Zakariah & Ujang, 2015). Rahman (2015) posits that a place is accessible when there is an equal opportunity for everybody to use public spaces. Wicramasinghe and Dissanayake (2017) studying the Central Business District of Kandy in Sri-Lanka observe that the flow rate and the presence of obstacles are key determinants of pedestrians avoiding walkways and instead using dangerous carriageways.

2.3 Sense of community

As the sense of community for people living around decreases, the significance of the street to people tends to diminish. As Banerjee (2001) observes:

> "the dizzying pace of the information and communication technology revolution is contributing to profound changes in the traditional concepts of place and community, local versus global interests, individual and group identities, and the nature of daily commerce and social relations." (p. 10).

Rogers (1998) established that the level of interaction between neighbours and their sense of community is inversely proportional to the amount of car traffic on their street. The sense of community and the effect of street conditions varies with the user groups (children, elderly, male, female) and all these entities must be part of decision making (Gehl, Gemzoe, & Rogers, 2006; Matsumoto et al. 2009; Inoue et al., 2011). Continued motorisation has specifically affected children's independent experience of urban streets as well as their physical activity (Gehl et al. 2006; Valentine & Mckendrick,1997; Veitch et al 2006; Carver, Timperio & Crawford, 2007).

A study investigating neighbourhoods in Perth Australia found that sense of community is greatly influenced by perceptions of the locality as compared to the objective charcteristics of the environment (French, Wood, Foster, Giles-Corti, Frank, & Learnihan, 2014). Although physical elements are considered based on the potential affordances they offer in public spaces, contextual affordances are considered on the basis of the configuration of the locations they are being placed (Ghavampour, Aguila, & Vale, 2017). Meanwhile, Abdullah, Marzbali, Tilaki, & Bahauddin (2015) observe that people living around less permeable streets have higher social cohesion than those living along more permeable streets. Some scholars have argued for the delicate balance between liveliness of streets and the welfare of local residents in neighbourhood areas since issues such as crowding lead to both positive and negative effects. To Baum, Davis, John, and Aiello (1978), although local markets and pharmacies increase the liveliness of local street spaces, they also interfere with residents' appropriation of spaces adjacent to their homes, and their interaction with other residents; such streets are thus evaluated negatively.

2.4 Carfree models

2.4.1 Intrinsic Carfree

In this study, the term “intrinsic carfree” refers to cities, neighbourhoods or particular streets that were never established with car access in mind; access is limited to other means such as walking, horse rides, or boats, while the built environment is often at human scale. The authenticity of these spaces is not limited to the exclusion of cars but also the surrounding human activities such as craft-making, cultural celebrations, and leisure.Great examples of intrinsic carfree streets are the Medinas of Morocco. The Fes el-Bali medina founded in 789 (figure 2.1) is one of the largest carfree urban areas in the world (Ouaknine-Yekutieli, 2015).

Figure 2. 1: Fes al-Bali Medina in Morocco
Source: global-geogrphy.com

Together with Fes al-Jadid the other carfree walled area founded in 1726, the Fes’s residential quarters houses 160,000 people in 300 hectares in additional to artisan’s

workshops and other landuses (Ouaknine-Yekutieli, 2015). The Medina is also a UNESCO world heritage site. Abdullah (2015) observes that Medinas enhance self-sufficient communities that rarely depend on outside revenue; historically specialised in particular sectors: as holy shrines, as centres of trading activities, or as places for production of traditional crafts.

Venice is another famous carfree area (figure 2.2). Most of the access to the island is done through waterways; no cars traverse the streets. Carrera, Novello, and Gallo (2006) describe how alley spaces and private homes in Venice merge with doors of private houses opening directly into public streets.

Figure 2. 2: Mercerie Street in Venice. Source: explo-re.com

Patel, Gandhi, and Bhatt (2016) note how Venice is a solace of peace although one of the most densely populated places on earth, 340 people per square kilometre in 2011.

However, there is need for caution when pointing Venice as the epitome of carfree streets since it has been suffering in other aspects due to the idealism of its environment; population of residents has been on the decline as tourist numbers surge (Crawford, 2000).

Roji (narrow urban alleyways) in Japan is another example of intrinsic carfree streets that were never designed for car traffic (figure 2.3). Imai (2017) conceptualises them as nooks and crannies that celebrate the everyday life, the places where strollers get lost in contrast to the efficient public transport in other parts of the city.

Figure 2. 3: Roji (narrow urban alleyways) in Nezu, Bunkyo ward. Source: Author

To Schulz (2008), roji represent the non-spectacular semi-public spaces in Japanese cities that nonetheless standout in opposition to the contemporary discourses in urban planning. As one of fastest ageing societies, roji is an age-friendly element of cities such as Tokyo;

they form micro-communities within larger communities by connecting elderly residents to surrounding major shopping streets (To & Chong, 2017). Although alleys exist in many countries of the world, the importance of roji in Japanese cities is partly pegged on the significance of neighbourhoods in planning as compared to the national and regional plans (Imai, 2017). Roji are also remnant of the old Tokyo away from the more visible skyscrapers and expressways in Tokyo; they mirror the formerly close-knit relations among commoners that resulted from the congested neighbourhoods in Edo era and the sharing of utilities such as wells and latrines like urban ghettos (Imai, 2017). Unfortunately, the significance of roji as intimate places in daily life continues to reduce as new forms of housing and public spaces emerge (Imai, 2013).

2.4.2 Japan's carfree shopping streets

Japan's shopping streets also called shotengai are diverse; their appearances vary depending on the physical position, population, history, their function, and the degree of functional differentiation of the city (Fujimoto, 1953). These streets generally consist of a mix of business establishments such as shops, restaurants, and banks as well as scattered residential premises (figure 2.4). Leen and Huang (2007) trace the foundations of Shopping streets in Japan to as early as the Azuchi Momoyama period (1573-1600) when liberalisation of trade spurred the popularity of traditional markets called rakuichi rakuza. In the succeeding Edo Era (1603-1868), streets became key shopping venues for a variety of commodities as well as a community and children's play space (Suzuki & Almazan, 2015). Whereas the significance of these streets and their functional differentiation continued to evolve over centuries, the aftermath of the Second World War was a critical

moment as it prompted rapid growth of informal markets along the streets.

Figure 2. 4: Chuo-dori shopping street in Adachi Ward, Tokyo. Source: Author

Since Japan has one of the highest proportions of narrow streets across the globe (Kwon, Morichi & Tetsuo, 1997) the physical structure of the streets is very unique, and the mix of shopping and social activities is more sophisticated than shopping streets in other countries. Many of the Shopping streets in Tokyo are also closely related to adjacent railway lines and train stations; many intersect railway lines perpendicularly at the stations (Ohno, 2006). While goods in the local street largely reflect the people's needs (Tsuboi & Kitano 2010), with rapid globalisation of economic activities and business chains increasing in Japan and the world at large, the uniqueness of each shopping street is being eroded. Local shopping streets are vernacular spaces that are often inconsistent with modern economic modernisation and consumer culture; they produce aesthetics, collective memory, traditional forms of interaction, and a feeling of local identity (Zukin, 2012).

Most shopping streets in Japan consist of independent small-scale traders with a wide variety in the products they sell, promotion methods, and ownership structures; the involvement in the local shopping street associations is also deemed voluntary. Agglomeration of retailers in shopping areas is laden with challenges such as marketing them as integrated entities, provision of facilities such as toilets, vehicular access, and parking (Teller & Reutterer, 2008). Shopping streets in Tokyo are thus not flourishing due to their inability to compete with emerging facilities; above fulfilling the necessary shopping needs of residents, they are limited as a platform for optional activities, and in providing a pleasurable environment that can attract people. To Erkip, (2005) shopping has evolved from the basic buying and merged with leisure. Regarding comfort and convenience of shoppers, competition with huge shopping malls that are centrally managed from the start is often difficult. Customers prefer malls instead of shopping streets due to the atmosphere, support factors such as accessibility, parking facilities, and refreshments, assortment factors, as well as communication, sales, and promotional factors (Anselmsson, 2006; Teller & Reutterer, 2008). However, where malls are situated far away from the street, Tsuboi and Kitano (2010) observe that they have little correlation with the success or failure of the local street.

Liveliness of shopping streets is two-sided. On one side is the local community's communication entrenched in familiarity, cooperation, and collaboration, one whose intimacy is likely to grow with time; on the other side is the mere coexistence of strangers in public open space. Urban life and the consumer culture offer a platform for coexistence of people with differing objectives who may not be interested in advancing relations beyond the mutual respect on the street space (Zukin, 1998; Jacobs, 1961).

2.4.3 Carfree City Centres

Creation of carfree city centres involves an area wide ban on traffic to the functionally necessary (e.g. by allowing fire trucks and ambulances) in order to increase attractiveness and economic vitality (Topp & Pharaoh, 1994; Hass-klau, 1993). For example, Arslanli, Dokmeci, and Kolcu (2017) demonstrate how restriction of cars in Istiklal Cadessi street (figure 2.5) in Istanbul in 1990 reinvented the street as a popular place for business and entertainment

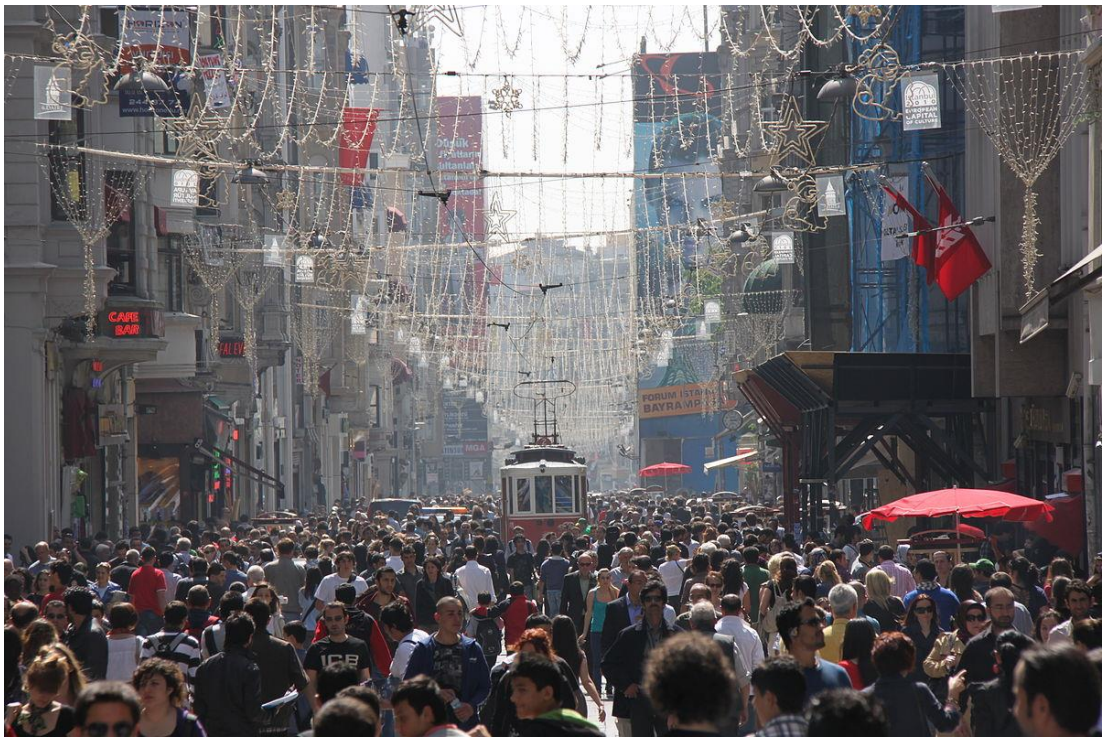

Figure 2. 5: İstiklal Caddesi street in Turkey. Source: ImgCop.com

Soni and Soni (2016) note that pedestrianisation is an inexpensive way of dramatically enhancing the identity and economic prosperity of city districts. Additionally, businesses are impacted differently depending on the items sold: businesses dealing with leisure items benefit a lot from car restrictions compared to businesses dealing with traditional

items whose buyers are drawn to traditional items no matter the environmental settings embedded in the location (ElFouly & Ghaly, 2017).

Hass-klau (1993) warns that before evaluating the influence of car restrictions in city centres, there is need to understand the external factors such as trends in the national and local economies, the overall strategy by the city, degree of accessibility of cars and public transport, and the population density within walking distance of the carfree area. Success of restrictions of cars in City Centres depends on a combination of push factors (such as parking space restrictions and congestion management) as well as pull factors such as attractive pedestrian facilities and more frequent trams and buses (Topp & Pharaoh, 1994). Hass-klau (1993) notes that initial studies on the effects of restricting vehicles in Europe concentrated on increase in the number of pedestrians; later growth in businesses became a major consideration. He also noted that business returns tended to be negatively affected at the beginning especially for those close to the carfree area due to initial capital input, but business improves later. There are also problems associated with gentrification when car restrictions in commercial areas cause increased rents and displacements of traders (Özdemir & Selçuk, 2017).

2.4.4 Woonerf and Home Zones

Woonerf or woonerven (directly translates to "residential yard" in english) shown in figure 2.6 is a street design allowing for sharing of street space between human activities such as walking, cycling, social activities, and children's play with vehicular requirements such as movement and parking of vehicles serving a local neighbourhood (Hamilton-Baillie, 2002). According to Mooij and Gameren (2010), the woonerf dates

back to the 1960s in Emmen, Netherlands in efforts to ensure the coexistence of outdoor activities as inspired by an idealist village life. These efforts in Netherlands were started by De Boer who designed streets to create the impression of driving through a garden (Hand, 2007). Legally, the idea is that when a driver injures a child, he is held responsible for negligence (Preston, 1995).

Figure 2. 6: Woonerf. Source: volumeone.org

Major characteristics of Woonerfs include a signage marking the beginning or gateway of the woonerf, a curved roadway, absence of kerbs, varying street widths, as well as landscape features such as flowers and rocks (volumeone.org). Woonerfs have been applied in more than 7000 places in Holland (Hamilton-Baillie, 2002). In this model, cars are allowed to traverse neighbourhood streets on the condition that they are at walking speed and do not disrupt other activities (Crawford, 2000). Ben-Joseph (1995) associated

the growth of woonerfs to critiques on the rigidity of standardised streets that tend to ignore unique challenges in neighbourhoods: aspects such as width, sight distance, and curve radius that are encouraged for the flow of vehicular traffic also encourage high speeds that are incongruent to the needs of residential areas. Unfortunately, cars still need higher speeds outside these precincts and only displace traffic from one area to another (Crawford, 2000).

In the UK woonerfs were adapted as "home zones." Hand (2007) argues that Woonerfs originated from the UK through a report by Colins Buchanan in 1963 for the ministry of transportation, but the Dutch were quicker to adopt and implement the idea. The idea by Buchanan emerged as a solution to the conflict between efforts to ensure flow of vehicular traffic and the degradation of residential streetscapes.

Gill (2006) traces the prominence of the "Home Zone" concept to the early 1990s in efforts to enhance the safety of children from traffic related accidents on streets although there were earlier attempts in the 1970s and 1980s aimed at shared streets based on the woonerf model of the Dutch. Home zones were championed by individuals, non-governmental organisations, as well as residents' groups such as the Methleys community in Leeds (figure 2.7) that started by laying grass on a street on a weekend in 1996 and became one of the first pilot project by the UK government (Gill, 2006).

Figure 2. 7: Home Zone in Methleys, Leeds. Source: flickr.com

2.4.5 Carfree housing

Carfree housing is a term covering various housing typologies with limited provisions for car ownership, access, and parking; restrictions include increased parking costs, limiting the number of cars owned and the availability of parking spaces (Rodier & Shaheen, 2003). Many of the initiatives began as pilot projects by city authorities in collaboration with developers (Scheurer, 2001). Some models have residents tied to be carfree through lease or purchase agreements, while others are not supported by legal agreements (Scheurer, 2001). Carfree housing has emerged as a model for sustainable consumption with lower environmental impacts regarding ground transportation and energy use; carfree environments also tend to enhance environment-friendly behaviours and

residents' consciousness about sustainability is high compared to residents in areas that are not carfree (Ornetzeder, Hertwich, Hubacek, Korytarova, & Haas, 2008).

Ornetzeder et al (2008) also show that there is a relationship between carfree housing and social cohesion although they could not clarify whether consumption patterns galvanised people or whether social cohesion caused pressure towards ecological behaviours. However, acceptance of carfree housing schemes depends on the penetration of public transport, attitudes towards cycling, and availability of carsharing (Rodier & Shaheen, 2003; Scheurer, 2001). Vauban (Figure 2.8) is known as the world's largest carfree housing, a former army barracks in the South of Freiburg City in Germany.

Figure 2. 8: Residents in a street in Vauban, Germany. Source: Pinterest.com

The success of Vauban as a carfree residential area can be attributed to other environment-related campaigns such as opposition to the establishment of a nuclear plant in Freiburg in the 1970s, Freiburg's general "green lifestyle" efforts such as progressive pedestrianisation of the city centre, as well as provision of low-cost public transport (Melia, na).

2.4.6 Carfree Cities

The development of Masdar city in Abu Dhabi that began in 2006 aimed at building a carfree, zero-emission city for 40,000 people (including a research institute for environmental technologies) all connected by a driverless "personal rapid system" of electric pods running on tracks (figure 2.9); the exclusion of cars is intended to allow for narrow, human scaled, shaded streets funnelling cool breezes from one part of the city to another (Masdar plan, 2008). The "personal rapid transit" extinguishes the need for cars and operates for 18 hours, 06:00 am to midnight (Masdar.ae). This adventure has opened discussions on the practicality and sustainability of developing new cities that thrive without cars on their streets.

There are many pessimistic views about the future of the project. There are fears that it will become "the first green ghost town" since only 300 people have occupied the city so far, mostly students of the Institute of Science and Technology, while streets are deserted and large tracts of land remain empty (Goldenberg, 2016). The country is also faced by a culture in favour of high consumption (as evident in sports cars and unnecessary air

conditioning in homes) and therefore conservation concepts such as Masdar City 's renewable energy efforts have not attracted residents (Liu, 2018).

Figure 2. 9: Private Rapid Transit in Masdar City. Source: Masdar.ae

Pontevedra City in Spain (figure 2.10) is a good example of cities where cars have been banned to enhance the environment for pedestrians; it is a historical city whose image was getting damaged by through-traffic. The process involved restricting cars from crossing the city centre, elimination of surface parking spaces, creation of periphery and underground parking spaces, and traffic calming on streets outside the core area to reduce traffic speeds to 30km/hr; the results include reduction of traffic deaths by around 90% in the first ten years, reducing CO2 emissions by 70%, and an increase in 12,000 inhabitants even as surrounding cities shrink (Burgen, 2018). The family-friendliness has also led to increase in the number of children; children can walk freely without fear of cars in an atmosphere equated to malls, and they can also play with their peers by bringing their toys to the streets (Velasquez, 2018). As such, carfree cities are seen as alternative solutions to aging societies by providing parenting-friendly urban environments in place

of birth-incentive policies that offer a one-time payment per every birth (Velasquez, 2018).

Figure 2. 10: A street reclaimed from cars in Pontevedra City.
Source: newsmobile.in

2.4.7 Carfree Sundays

Cities across the globe have introduced carfree Sundays to create awareness of the safe and clean environment that emerges when cars are excluded from city streets; Brussels, Jakarta, Kigali, Antwerp, and Mexico City are key examples. People used to cars get an opportunity to engage in various recreational and shopping activities in a relaxed environment. For Brussels, carfree Sundays entail the banning of all vehicles except emergency vehicles and public transport vehicles that are limited to 30km/hr from 09:00 till 19:00h (Vanderstraeten, Forton, Brasseur, & Offer 2011).

Figure 2. 11: A car-free Sunday in Kigali City, Rwanda.
Source: Kigali Today

2.5 Cars in Developing Countries

Developing countries are experiencing increased car ownership and use. Since cars are considered as elements that people "naturally desire" due to their symbolic value for status, power and affirmation, decision makers in developing countries have been pressed into two choices, both that inevitably lead into more car dominance and less transition into public transport: conservative policies that view and let increased automobilization as an unescapable response to consumer trends, and policies that hope for voluntary transition into public transport (Vasconcellos, 1997).

Meanwhile, the load of traffic-related problems such as road traffic injuries are disproportionately severe compared to their developed counterparts; the variations across

groups such as car users against pedestrians or poor against rich are also very wide in developing countries (Nantulya & Reich, 2002; Pojani & Stead, 2015). Ogendi, Odero, Mitullah & Khayesi (2013) while studying pedestrian injuries in Nairobi found that pedestrians constituted the largest proportion of those admitted in hospital for road traffic injuries (59.1%) when compared to motor vehicle passengers and motorcyclists; among motorized four-wheeler vehicles involved in collisions with pedestrians, cars lead (39.4%) followed closely by matatu, 14-seater mini-buses (35.5%).

Even though pedestrians are the most vulnerable, most governments in developing countries are still making policies and directing funds to projects that improve the flow of motorized modes while neglecting those using more vulnerable means such as cyclists and pedestrians (Klopp, 2012; Kumar & Ross, 2006; Adejumo, 2010). Meanwhile, Masuri, Isa, & Tahir, (2012) note that most traffic crashes are a result of negative human behaviours and not inadequacies of infrastructure. Research has also demonstrated some long-term effects of "induced travel" where improved infrastructure causes people to increase car use hence returning the cities to their initial problems with automobiles (Pojani & Stead, 2015).

Gakenheimer (1999) demonstrates that issues such as driver discipline, the mix in types of vehicles, centralization of local transportation development and desire for auto ownership are very prevalent in developing countries compared to their developed counterparts. The informal sector represented in activities such as hawking is also unique in developing countries. Transportation policies in developing countries are influenced by the government 's big role in economic development compared to liberal developed

countries, top-down decision-making processes, economic instability, and prominence of informal economic activities (Vasconcellos, 1997). Unfortunately, as Crawford (2000) observes, the Middle Class in developing countries has continued to model its life from the US styles seen on television. Meanwhile, Klopp (2012) cautions that imagining that the solution to urban motorization is pegged on constructing more roads is not only short term but also expensive.

Vasconcellos (1997) argues that a sociological approach is necessary in understanding motorisation challenges in developing countries since such an approach recognises the social, economic, and political contexts, breaks down the characteristics (such as variations across various social and financial classes regarding who is buying and the purpose of buying) of consumers seeking cars, and also places the discussion in the wider context of economic development and the tactics by the automobile industry. Pojani & Stead (2015) opine that improvement of existing bus systems into more effective Bus Rapid Transit Systems is a wise investment due to its effectiveness when compared to Light Rail Systems, while other schemes such as appropriate parking charges and improved pedestrian infrastructure are complementary in reducing problems of automobile dependence in developing countries.

A study on two neighbourhoods in Sri-Lanka (Ranasinghe, Amarawickrama, & Rathnayake, 2016). categorised factors affecting walkability into eleven categories:

1. Socio-demographic factors e.g. age, gender, and level of education
2. Diversity in mix of land uses e.g. agricultural and industrial land uses
3. Accessibility as evident in the number of footpaths and presence of barriers etc

4. Connectivity aspects such as street patterns and number of buses per day
5. Density aspects e.g. residential density and retail floor Area Ratio
6. Aspects of accompaniment e.g. walking with another person or a pet
7. Weather conditions
8. Convenience and Comfort encompassed in aspects such as cleanliness and number of houses with street-ward windows
9. Safety issues e.g. the number of crime warning signs and number of unattended dogs
10. Aspects of aesthetics such as attractiveness of architectural designs and the presence of street trees
11. Pedestrian facilities such as footpaths and street furniture

However, although the influence of built environment factors and feelings of individuals, connectivity to, and availability of public transport are key motivations of people's walking behaviour, social company particularly the presence of relatives and friends are also key determinants, while land use diversity, density, weather, and pedestrians are merely contributing factors with no significance in determining walkability of the neighbourhoods (Ranasinghe, Amarawickrama, & Rathnayake, 2016). Efforts to shift away from automobile-oriented systems are hampered by hesitation to effect radical measures. For example, Meetiyagoda (2018) observes that although there are plans towards pedestrian-oriented systems in the historic city of Kandy in Sri Lanka, retention of parking spaces in rear-side streets negates efforts at restricting cars crossing the pedestrian areas.

2.5.1 Central Business Districts in Developing Countries

Carfree streets in central business districts (CBDs) are gaining prominence as critical elements in the functioning of many cities globally; they provide a pedestrian centred mobility structure that eases shopping activities, social interactions, and other aspects of urban life associated with pedestrians. Central Business Districts (CBDs) generally consists of a high concentration of activities such as shopping, office, cultural, administrative, entertainment, wholesales, and industries in contrast to the homogenous residential and industrial land uses in their surroundings (Funsho, Bukola, & Omoyeni, 2013). Unlike neighbourhoods, these areas have a wider variety of user groups including visitors, traders, and residents. Additionally, walking is the best way to experience these areas because of the high development density and congestion that do not allow for a pleasant driving experience (Zakariah & Ujang 2015). Many scholars have presented recent efforts to introduce carfree schemes in CBDs for reasons such as safety, visual attractiveness, reducing air pollution, and economic revitalization (Nieuwenhuijsen & Khreis, 2016; Kumar & Ross, 2006).

Control over motorization in CBDs has however been left to capitalist forces such as shop owners' perceived sales, clients' convenience, and city governments' parking revenues. Consequently, the needs of people utilizing the street spaces in daily life have been neglected; representation and political power of vulnerable groups is minimal particularly in developing countries where power plays considerably favour the elite.

Kumar & Ross (2006) have shown the influence in car restrictions on increased sales volumes in addition to making streets safer and more pleasant. Based on data from 400

UK towns and a significant number of German towns, Hass-Klau (1993) has demonstrated a general positive effect of pedestrianization on retailing with some variations such as shops inside pedestrian areas being more successful than outside ones, and more extensive schemes having more substantial positive effects than the less extensive schemes. However, the author notes that there can be a reduction in turnover during a transition period of 1-2 years with fringe shops just outside the developed area disadvantaged. Topp & Pharaoh (1994) mention that precedents such as pedestrian zones and traffic-calmed areas which initially received opposition eventually increased in economic activities. Some specific contestations by the business community regard the timing of carfree programs. For example, although evenings are optimal time for carfree arrangements due to the accumulation of people after work, bar and club owners oppose night-time ban on cars since it is the peak for their businesses (Pojani, 2007). In general, evidence from previous studies shows that impediments to carfree schemes are more political than they are technical (Topp & Pharaoh, 1994; Pojani, 2007). Retailers and organizations representing them often oppose schemes to reduce or eliminate car access and parking to their businesses even with evidence of improved business that comes with pedestrianization (Melia & Shergold, 2016).

Chapter 3: Methodology

3.0 Introduction to the research design

This chapter offers an overview of the process of collecting empirical data for this thesis as regards the data collection methods, processes of analysing different measures of the dependent and independent variables as well as the planning and necessary adjustments that informed the final layout of the results. A brief description of the foundational philosophical concepts that have advised the selection of methods and tools is also offered. The general flow is shown in figure 3.1 but the particularities of the methods used in each study are discussed separately in each chapter of results.

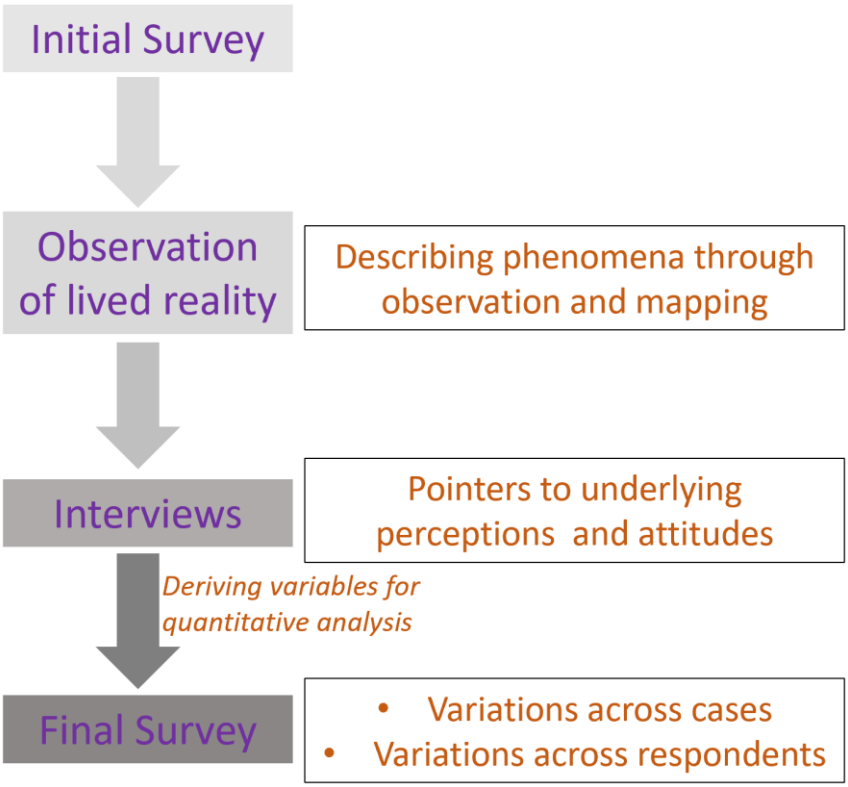

Figure 3. 1: research design

The research design is generally structured as a case study research consisting of a variety of cases as suitable in pursuing each of the four objectives of this study. Some of the studies are framed by flexible designs of qualitative analysis using interviews and direct

observation (chapter 6 and 7), while the others are fixed, relying on quantitative data collected through surveys (chapter 4,5, and 8). In addition to the descriptive analysis of the case studies' results, an attempt is made to make additional correlational analysis to define the magnitude of relationships among variables and across cases.

3.1 Conceptual Rationale: science of space

The power plays in appropriation of street spaces comprise of both the visible contestations evident in the interaction of physical objects such as people and cars as well as the hidden contestations consisting of conflicting objectives. Consequently, a duo approach was taken: it involved investigations of observable phenomena and investigations to unravel underlying codes that guide action.

Critical theory is used as the organising factor in evaluating the meaningfulness of people's experiences, involvement or participation in street activities, and their perceptions about the effects of cars in their neighbourhoods. Lefebvre (1991) proposed the generation of practicable knowledge about social space through codes constructed from lived reality in place of earlier translations of mental space into social life that relied on literary texts that only tended to stagnate the discourse at the descriptive level. As such, the street space is approached as a process of signification that affords us an opportunity to read or decode the codes that make up the prevailing conditions of the street environment, nature of street activities, and people's attitudes. Through direct observation and mapping as well as participant observation as part of learning through partaking in the lived experiences residents and organisers of street activities (chapter 6), attempts were made to explain the present as well as the codes that can be applied in describing it.

Participant observation allows a scholar to get immersed into the lives of subjects in search of a new theory instead of seeking to confirm or refute existing theories; however, the interaction between the observer and the observed is part of the result, an advantage in enhancing the quality of the results, but a disadvantage to the neutrality of the scholar as an observer (Pine, 2015).

A proper understanding of these codes would not be possible without imposing the author's own ideas, a situation that would rescind the discourse back to the normative ideas of experts. The codes deduced from observations were hence subjected to critical review through interviews with community leaders, play leaders as well as scholars in related fields as presented in chapter 7. This stage also allowed the author to clarify conflicting patterns that emerged from the observations. Finally, variables emanating from this process were subjected to quantitative evaluation on four neighbourhoods (chapter 8).

3.2 Analysis

Data analysis involved qualitative and quantitative methods. Qualitative analysis of interview data (chapter 7) began by thematic analysis to organise data and identify emergent themes and key words, as well as implicit and explicit categories and trends. For easier interpretation of the complex text data, KH Coder software was employed to investigate frequency in occurrence of words as well as Networks between words and concepts. Consequent to the KH Coder findings, analysis of recurrent themes and key words was done manually; the context of each keyword in the interviews was also manually re-examined to identify patterns and trends in relation to observed reality. For

interpretation and discussion, critical examination framed by Lefebvre's view of abstract space was done to link the study results, reality, and theoretical concepts. Finally, extra reviews of secondary sources were consulted to enrich the discussion. Document study regarding relevant regulations was also carried out. The Road Law of 1952, the Road Traffic Act of 1960, and the Tokyo Road Occupation Rule of 1972 were consulted.

Using SPSS software, analysis of quantitative data began by descriptive analysis including frequency and percentages of counts for key variables on SPSS software. This was followed by One-way ANOVA test of variance to determine the statistical significance ($p \leq 0.05$) of differences across cases. Thereafter, relationships between variables was measured through bivariate correlations. Where Likert scales were used, factor analysis and Principal component analysis was used to determine the contribution of variables to the total variance, and to present the major components under which the variables could be grouped.

Chapter 4: Potential for Livening the Nairobi Central Business District through Carfree Streets.

4.1 Background to the study area

Nairobi is the capital city of Kenya, an inland city (figure 4.1) with a population of 3.5 million people; it is also one of the biggest business hubs in Africa. Its foundations as an urban area began in 1896 as a transport depot with stores and stables, and became a railway station by 1899 for the British colonial government; it had a population of 11,512 in 1906 and 108,900 in 1948 (White, Silberman & Anderson,1948).

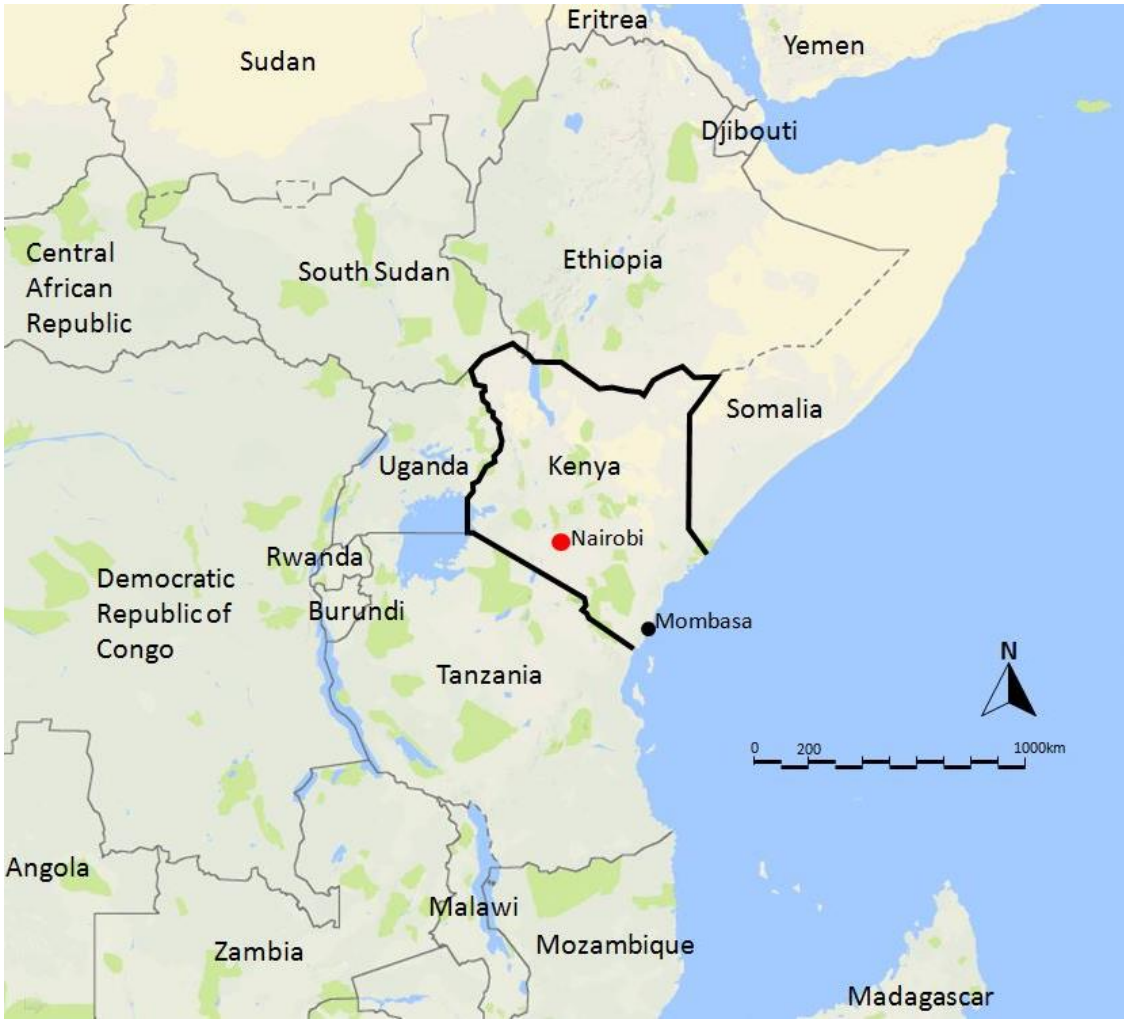

Figure 4. 1: Location of Nairobi, Kenya. Source: Author, adapted from GoogleMaps.

Currently, public transport is dominated by Matatu, (private-owned mini-buses and vans) shown in figure 4.2. Inefficient use of public spaces, demand-based fluctuation of fares, unscheduled departure and arrival times, accidents, and crime are major challenges in the

matatu system; most matatu routes terminate within the CBD. The resultant congestion is worsened by indiscriminate access by private cars and motor cycles, pedestrians, and informal traders.

Figure 4. 2: Matatus on Tom Mboya street in Nairobi. Source: star.co.ke

White, Silberman, and Anderson (1948) note that by 1906 differentiation of Nairobi was largely based on racial segregation in addition to the Railway-related developments. Decades after the end of the British Colonial Government in 1963, there are general distinctions between the uptown and the downtown. The uptown generally refers to the area on the Western side of Tom Mboya Street while the downtown is on the Eastern side: the uptown has a higher proportion of older buildings inherited from the colonial era, and is generally dominated by high-end boutiques, banks, and restaurants. The downtown is dominated by cheaper restaurants, shops for motor vehicle spare parts, electronics,

clothes, and shoes; buses and matatus are also concentrated on this side; examples include Tom Mboya street. On the other hand, streets in the uptown such have less traffic congestion compared to the Downtown.

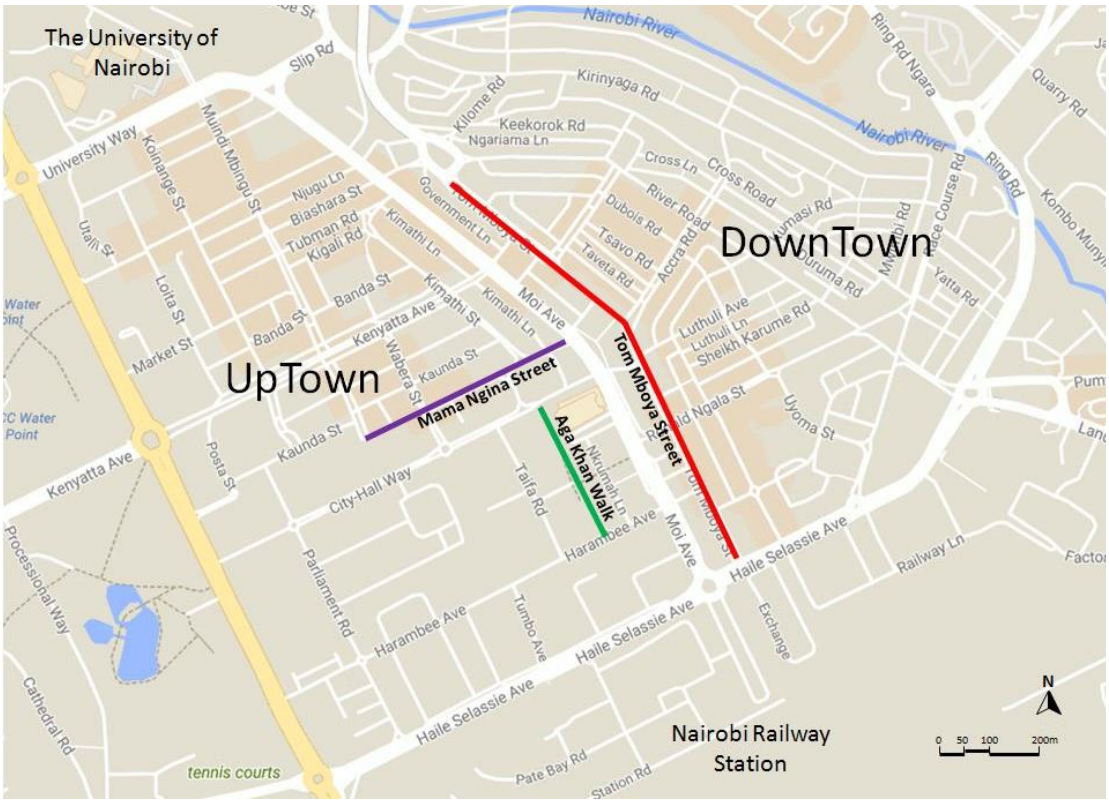

Figure 4. 3: Street layout of the Nairobi CBD showing the Downtown and Uptown. Source: Author,

4.2 Aims and objectives of the study

The primary aim of this paper is to present pedestrians' evaluation of safety, comfort, and convenience in varying levels of traffic. The study also explains the differences between the perceptions of day-to-day street users and the priorities of key decisionmakers. Three street types (typical car street, one-way street, and carfree street) are examined to expose the implications of vehicular traffic and the effect of carfree streets on pedestrians` wellbeing. In particular, it investigates three research questions:

1. How do decisions of government agencies and the private sector prioritise automobiles at the expense of people's stay activities?
2. What is the level of consciousness that people in Nairobi have towards automobiles and current automobile restrictions?
3. How do pedestrians perceive elements of safety, comfort and convenience, and connectivity?

4.3 Methodology

This study is based on a questionnaire survey of pedestrians and structured interviews with key stakeholders in Nairobi. A pilot survey with open questions was first administered on thirty-one respondents to test the effectiveness of the questionnaire; some of the answers were used in the final questionnaire as choices for the close-ended questions. Traffic density and physical conditions of streets in both the downtown and the uptown areas were also analysed.

One-way ANOVA analysis of variance was used to describe pedestrian's perception of each of the 37 variables (such as fear of crime, availability of seating areas, and access to bus stops) and the statistical significance of variations across the 3 street types (car-street, one-way street, and carfree street). The results were presented in the three categories: safety (19 variables), comfort and convenience (9 variables), and connectivity (9 variables). The next step involved the computation of the three composite (dependent) variables through numeric transformation of substituent variables for each. Linear regression was done to estimate the relationship between each of the three dependent variables (safety, comfort and convenience, and connectivity) against personal attributes

of respondents such as age, gender, occupation, and level of education. A bi-variate correlation analysis was also done to find the relationship between safety, comfort and convenience, and connectivity.

Due to time and financial constraints, three streets were selected. Tom Mboya Street was selected to represent typical car streets (figure 4.4). The Aga Khan Walk (figure 4.5) is the only major street within the CBD that is carfree. It is approximately 20metres wide and extends for around 300meters from City-Hall way to Harambee Avenue. Popular buildings along it include Uchumi Supermarket, Kenya Cinema and Kencom building. Mama Ngina Street (figure 4.6) is a lively one-way street that hosts a variety of business entities such as elegant restaurants, banks and foreign fashion chains in what is considered as a prestigious part of Nairobi CBD in contrast to the downtown. With a width of around 20 meters, it stretches for roughly 450 meters from City Hall to Moi Avenue.

In total, 399 questionnaires were administered to pedestrians on Tom Mboya Street (169), Mama Ngina Street (115), and Aga Khan Walk (115). The questionnaire consisted of four main sections: 1. Respondents' street use characteristics such as the objective and frequency of using the street, 2., users' satisfaction on aspects of safety, comfort, and connectivity based on a Likert scale of five points, 3. attitudes towards car restrictions, and 4. respondent's personal attributes such as age, occupation, and gender. Structured interviews involved 6 people: 2 engineers from City Government, 1 former director of planning in the City Government, 1 former leader of the Nairobi Business District Association, and 2 academics in Planning and Landscape Architecture in Nairobi. Interviews with stakeholders attempted to unearth the underlying factors that have shaped

the current prioritization of automobiles and consequent neglect of pedestrian affairs. The interviews aimed at getting a deeper understanding of the intricacies undermining the needs of pedestrians and the prioritization of automobiles.

Figure 4. 4: Tom Mboya Street. Source: Author, 2018

Figure 4. 5: Aga Khan Walk. Source: Author, 2018

Figure 4. 6: Mama Ngina Street. Source: Author, 2018

4.4.0 Results and Discussion

4.4.1 Attributes of questionnaire respondents

Respondents to the questionnaires comprised of 60.3% male and 39.7% female; respondents in the 20s-age group constituted the highest proportion (49.2%) followed by 30s (23.8%), 40s (12.3%), below 20 (7.8%), 50s (5.1%), 60s (1.6%), and the lowest were those in the 70s age-group (0.3%). Only 28.1% of respondents own cars. Regarding street usage, 47.3% of respondents generally use the streets daily and only 6.1% were on the streets for the first time. However, 26.6% of respondents did not enter any establishment on the streets they were interviewed in; 29.2% had entered restaurants followed by finance-related establishments such as mobile-money bureaus (11.7%). Regarding the purpose of being in the CBD, respondents who came to meet a friend comprise the largest proportion, 30.6%, followed by those doing business (22%), and those who work in the CBD (20%).

4.4.2. Restrictions

Regarding vehicles that respondents want restricted from accessing the CBD, most respondents were concerned by matatu (41.1%) followed by motorcycles (39.5%), and private cars (10.6%). Although not included among the choices, 8.7% of respondents proposed the exclusion of hard-push carts. Matatu were perceived as the greatest threat, but it is clear from the interviews that most decisions to restrict Matatu have not been implemented because of the political influence of people involved in the matatu business. From interviews, a lot of the mobility problems are related to poor public transport that is dominated by low-capacity vehicles instead of a mass transit system.

Regarding streets that need temporary restriction of vehicles, Tom Mboya Street leads at 40.7% among the choices given; it also leads at 35.3% regarding streets where cars should be permanently restricted. Other streets mentioned are shown in figure 4.7.

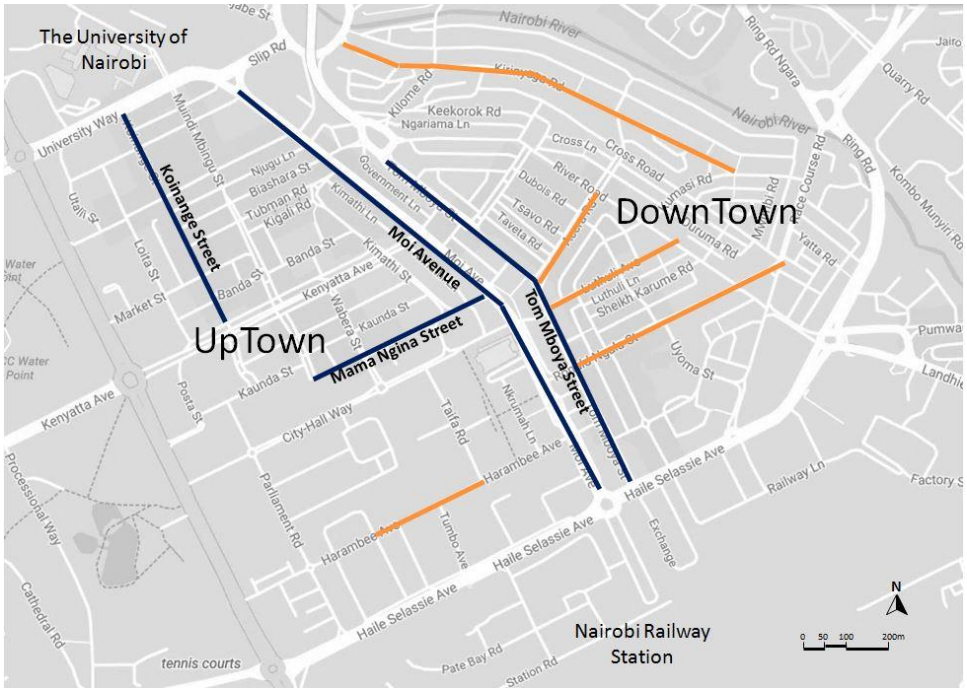

Figure 4. 7: Streets suggested for car restriction
Source: Author, adopted from GoogleMaps.

4.4.3 Satisfaction with safety

In general, respondents were most satisfied with safety on the carfree street followed by the one-way street; the street with many cars has least perceived safety. Variations among the three streets were statistically significant for all variables except "safety at night" and "actions of beggars" as shown in table 4.1. Safety at night was evaluated unfavourably on the carfree street; this could be attributed to the trees and shrubs where criminals can hide as well as low volumes of pedestrian traffic due to low proximity to matatu stations. Safety at night ranks highest on the one-way street; this may be attributable to the presence of bars and restaurants that operate at night. In general, non-criminal activities

of other people such as beggars and preachers were evaluated as satisfactory as compared to perceptions regarding crime and stranger danger. The ranking for activities of beggars is almost the same for the three street types.

Table 4. 1: One-way ANOVA analysis for Safety

	Car Street		One-way Street		Car-free Street		p value
Variable name	Mean	SD	Mean	SD	Mean	SD	
Safety from strangers	2.83	1.106	2.90	1.144	3.28	1.148	.003**
Safety from crime	2.64	1.193	3.08	1.119	3.16	1.231	.000***
Safety from vehicular traffic	3.21	1.039	3.14	1.138	3.66	1.135	.000***
Antisocial activities	2.93	1.049	2.73	1.048	3.37	1.115	.000***
Safety at night	2.79	1.211	3.07	1.103	2.87	1.182	.149
Safety for children and elderly	2.56	1.117	2.96	1.141	3.35	1.178	.000***
Actions of beggars	2.37	1.229	2.54	1.072	2.47	1.169	.469
Actions of preachers	2.59	1.227	2.78	1.120	3.01	1.306	.020*
Actions of hawkers	2.78	1.271	2.59	1.247	3.01	1.331	.049*

* statistical significance ≤ 0.05 ** statistical significance ≤ 0.01 *** statistical significance ≤ 0.001

4.4.3.1 Correlation of safety against respondents' personal attributes

When safety is correlated against personal attributes of respondents such as car ownership, there is a weak correlation and no statistical significance in the relationship; same for gender, age, the frequency of using the street, and the objective of coming to the CBD. However, although, there is a weak correlation, level of education is statistically significant in predicting safety, p=0.026 as shown in table 4.2.

Table 4. 2: Correlation of Safety against respondents' personal attributes

	R value	***p value***
Car ownership	.028	.879
Gender	.112	.123
Age	.138	.505
Level of education	.195	.026*
Frequency of using the street	.091	.742
Objective on the street	.205	.119

* statistical significance ≤ 0.05

4.4.4 Satisfaction with Comfort and Convenience

In general, the carfree street, Aga Khan walk is ranked higher in terms of satisfaction on most elements of comfort and convenience; it is followed by the one-way street, and lastly, the street with cars. Variations among Car Street, One-way Street, and the Carfree street were statistically significant for all variables except satisfaction with "shade" and "dustbins" as shown in table 4.3. Opportunities for sitting on the carfree street have the highest score in the whole set. Seating ranks poorly in the other two street types; the Aga Khan walk has street furniture. In addition to pedestrian movement and sitting, it is host to various stay activities such as music and theatre performances as well as street vendors.

Table 4. 3: Comfort and convenience

	Car Street		One-way Street		Car-free Street		p value
Variable name	Mean	SD	Mean	SD	Mean	SD	
Condition of pavement	2.51	1.266	2.86	1.137	3.26	1.285	.000***
Surroundings` attractiveness	2.95	1.127	3.19	1.167	3.55	1.165	.000***
Opportunities to stand	3.11	1.103	3.12	1.153	3.59	1.022	.001***
Opportunities to sit	2.63	1.086	2.32	1.080	3.78	1.080	.000***
Congestion	2.49	1.202	2.91	0.996	3.28	1.121	.000***
Ability to talk or hear	3.10	1.074	3.27	1.013	3.68	1.028	.000***
Free from obstacles	2.98	1.189	3.17	1.070	3.63	1.066	.000***
Ability to participate in activities	2.88	1.145	3.07	1.038	3.36	1.179	.002**
Shade/cover	2.63	1.226	2.59	1.215	2.53	1.280	.788
Width/spaciousness	3.02	1.216	3.39	1.250	3.43	1.308	.009**
Greenery	2.92	1.241	2.92	1.239	3.52	1.235	.000***
Pleasantness of smell	2.75	1.173	3.21	1.260	3.00	1.363	.012*
Pleasantness of noise	2.37	1.106	3.04	1.085	3.24	1.219	.000***
General cleanliness	2.79	1.250	3.11	1.226	3.13	1.383	.046*
Mix of uses	3.25	1.107	3.19	1.138	3.63	.984	.003**
Dustbins	2.65	1.253	2.83	1.051	2.78	1.354	.442
Toilets	2.61	1.203	2.27	0.947	3.16	1.295	.000***
Opportunities to interact	3.03	1.139	3.12	1.053	3.70	.976	.000***
Liveliness	3.12	1.135	3.20	1.060	3.75	1.091	.000***

* shows statistical significance ≤ 0.05 ** shows statistical significance ≤ 0.01 *** shows statistical significance ≤ 0.001

4.4.4.1 Correlation of Comfort against respondents' personal attributes

When Comfort is correlated against car ownership, there a weak correlation and no statistical significance in the relationship; same for gender, age, level of education, frequency of using the street, and objective of coming to the CBD as shown in table 4.4.

Table 4. 4: Correlation of Comfort against respondents' attributes

	R value	***p value***
Car ownership	.110	.196
Gender	.073	.483
Age	.177	.290
Level of education	.151	.284
Frequency of using the street	.086	.848
Objective	.177	.488

4.4.5 Satisfaction with Access and Connectivity

In general, respondents are more satisfied with access and connectivity for the carfree street compared to the one-way street; the street with cars ranks lowest in regard to access and connectivity. Variations among Car Street, One-way Street, and the Carfree street were statistically significant for all variables except satisfaction with "access to destination," and "access to matatu/bus stop" as shown in table 4.5. The variable with the highest average score in this set is Carfree Street's "Access by foot." The one-way street ranks lowest with regards to access to bus stop since the uptown area is not served by public transport.

Table 4. 5: Access and Connectivity

	Car Street		One-way Street		Car-free Street		p value
Variable name	Mean	SD	Mean	SD	Mean	SD	
Ease of accessing the street on foot	3.01	1.221	3.20	1.166	3.87	1.019	.000***
No physical barriers e.g. fences	3.07	1.078	3.15	1.084	3.64	1.063	.000***
No need to cross busy traffic street	2.81	1.157	3.01	1.037	3.51	1.173	.000***
Directness of the street	3.31	1.000	3.28	.944	3.62	1.057	.021*
Access to your destination	3.48	1.004	3.38	1.130	3.58	1.059	.404
Access to matatu/bus stage	3.22	1.160	2.94	1.188	3.10	1.329	.169
Access to car parking	2.64	1.230	2.68	1.062	3.48	1.275	.000***
Connection with neighbouring streets	3.36	1.171	3.28	1.068	3.65	1.006	.030*
Visibility of other activities from the street	3.16	1.162	3.13	1.140	3.53	1.107	.012*

* shows statistical significance ≤ 0.05 ** shows statistical significance ≤ 0.01 *** shows statistical significance ≤ 0.001

4.4.5.1 Correlation of Connectivity against respondents' personal attributes

When connectivity is correlated against car ownership, there is a weak correlation and no statistical significance in their relationship; it is the same for gender, age, level of education, the frequency of using the street, and objective of coming to the CBD as shown in table 4.6.

Table 4. 6: Correlation of Connectivity against respondents' attributes

	R value	***p value***
Car ownership	.134	.052
Gender	.095	.231
Age	.168	.237
Level of education	.128	.375
Frequency of using the street	.148	.208
Objective	.145	.649

4.4.6 Correlation of Safety, Comfort and Convenience, and Connectivity in predicting the liveability of the streets

The relationship between safety, comfort, and convenience, and connectivity was done by computing the Pearson correlation as represented in table 3.7. A strong positive correlation was found between Safety and Comfort, r=.587 as well as between Comfort and Connectivity, r=.676. There was a moderate correlation between Safety and Connectivity, r=.475. These results show a stronger correlation to a study by Zakaria & Ujang (2015) that established .492, .499, and .448 respectively in their study on the comfort of walking in Kuala Lumpur.

Table 4. 7: Correlation of Safety, Comfort, & Convenience, and Access & Connectivity

	1	**2**	**3**
1 Safety	----	.587**	.475**
2 Comfort & Convenience	.587**	----	.676**
3 Access & Connectivity	.475**	.676**	

Source: Author **. Correlation is significant at the 0.01 level

Although studies have shown high density of people enhances vibrancy of a street (Samadi, Yunus, Omar, & Bakri, 2015), this study demonstrates that automobiles are hindrance to the enjoyment of street spaces. Even though Tom Mboya street is very vibrant, pedestrians evaluated it negatively for safety, comfort and connectivity. On the other hand, the potential in a carfree street like Aga Khan walk is not exploited optimally because it is situated away from the main sources of pedestrian traffic.

4.4.7 Side-lining of pedestrian needs by decision makers

From the interviews, the current side-lining of pedestrians in Nairobi in favour of cars is a complex issue that goes beyond mere designation of streets as carfree. Similar to many cities in developing countries, contestation for urban space involves pedestrians, motorists, on street parking, motorcycles, encroachments from commercial buildings, as well as informal traders.

Both the city government of Nairobi and the national government do not have the human resource capacity required to articulate the functions of streets both as mobility spaces and as spaces for stay activities. As Ahmed (2017) notes, it is difficult to achieve balanced use of street space without allowing compromises between streets' function for movement and streets' function as open spaces. The limitation in knowledge and experience regarding the benefits of pedestrians` safety, comfort, and connectivity has hindered efforts to priorities issues of carfree streets proposed decades ago. Additionally, side-lining of planners and landscape architects has also undermined design of high-quality streets that respond to needs of users of space especially regarding design and placement of open space elements such as furniture. This was a major issue during efforts

to pedestrianize Mama Ngina street; most decisions on behalf of the city government were made by engineers. During discussions between the City Council and local traders before pedestrianization of Mama Ngina Street, traders opposed the project because in their view, their clientele required car parking in the immediate outside of the establishment they were visiting (Karssenberg, Laven, Glaser, & van't Hoff, 2016). This ended in a compromise—the current one-way street that was done instead of full-scale pedestrianization. Despite this progress, the sitting areas established during this phase were later removed due to security fears.

Financial challenges have been a key in transforming typical car streets into carfree or one-way. As such, projects funded by the private sector have been prioritized but this often ignores the public welfare in favour of the funding entities. For example, from interviews, funding from one of the major business owners drove the initiative to convert Mama Ngina Street into a one-way street; the urgency was based on security considerations for high profile offices above the usability of the street space. Additionally, among ordinary pedestrians, there is a greater concern for streets in the downtown area compared to those in the uptown area. This contradicts current progress that has focused on pedestrianizing uptown streets. Rahman, Sakip, & Nayan (2018) also observe this tendency to make decisions favourable to business entities while disregarding pedestrians and vitality of streets.

Power plays among government agencies and departments in allocation of funds and responsibilities have undermined implementation of projects that could improve the welfare of pedestrians. Existence of agencies with overlapping mandates has also caused abdication of responsibilities as well as sabotage. For example, the newly established

Nairobi Metro Area Transport authority is in charge of issues also handled by the city government as well as the ministry of transport in the national government.

Challenges in handling informalities has discouraged carfree initiatives. Illegalizing of informal trade activities such hawking and peddling of goods has generated unnecessary conflicts on street spaces. Most interviewees agreed that the solution for informal traders is proper management of space and time to allow their co-existence with formal businesses. In addition, outdated by-laws prohibiting the use of the outpouring of café sitting areas onto the street (Karssenberg, Laven, Glaser, & van't Hoff, 2016) as common in other jurisdictions have curtailed the perceived safety and security promoted by outdoor street activities.

All interviewees were eager to use public transport if availed; the key argument revolves around the quality of such a system. The success of carfree streets is dependent on the public transport connecting the carfree districts to other parts of the city. It is difficult to get people to relinquish their cars for walking, cycling, or public transport since cars are images that people project whether false or otherwise and is not limited to developing cities. Klopp, (2012) advises on the need to provide public transport systems that offer more choice to the majority of city dwellers as a way of levelling historical injustices regarding the access to open spaces and opportunities. Gunn (2013) also notes that an urban strategy that prioritizes automobile over public transport works against the groups in the city's composition that are already disadvantaged regarding mobility such as the poor, elderly, women and children who also form the majority in urban areas. Efforts at restricting automobile access and circulation have not been applied where the greatest need is—reducing matatu access for streets in the downtown area. Since matatu stations

are major generators of human traffic, reducing automobile restriction should be in phases, otherwise the reclaimed streets will be abandoned. Adoption of reliable high-capacity public transport will ensure that people can easily access the CBD from other places and then connect within the CBD on foot in comfort and safety from traffic dangers.

In practice, class differences among users of public transport and car owners has created a gap in articulation of pedestrian needs since most decision makers do not use public transport. The establishment of out-of-the-city shopping and leisure zone is also a threat to the sustainability of the city Centre. This presents a two-edged challenge: declining urban quality from over motorization pushes out people while exquisite access and parking for the middle-class in other places pulls them outwards. Additionally, middle class and high-income earners use certain sections of the city. Although big malls allow for carfree shopping experiences, they serve a certain class, and the pedestrianisation continues to enhance the class separations.

The lack of political will in streamlining mobility challenges has derailed many brilliant ideas. In addition, changes in political regimes cause inconsistencies in implementation of existing policies. Cycles of electioneering have had a major impact on the influence of state power on urban planning issues in Kenya. Many radicle decisions are reversed during election periods through executive actions aimed at raising the popularity of regimes in power. At the policy level, the halting of a ban on 16-seater matatus towards the 2013 polls is a good example. Corruption has also given undue influence on decision-making to favour certain sections of the citizenry against others.

In sum, major decisions have not been based on research but the political and financial impetus of business owners hence a disregard for vulnerable groups. The huge gap between normative approaches of decision makers (mostly car users) and the experiences of low-income earners also alienates mobility policy from reality.

4.5 Chapter Conclusion

This study attempted to explain the potentials and challenges in initiating carfree schemes for cities in developing countries by evaluating perceptions towards three streets in Nairobi with varying density of vehicular traffic. The results depict the importance of understanding various elements of the three composite variables, safety, comfort and connectivity of streets in enhancing liveability. It is clear that users' perception of safety, comfort, and connectivity varies greatly among the three street types: carfree street (Aga Khan Walk) ranks highest followed by the one-way Street (Mama Ngina Street), while the street with many cars (Tom Mboya Street) ranks lowest regarding users' satisfaction with the three variables. Even though carfree streets and spacious one-way streets are highly appreciated by pedestrians, support infrastructure, landscape design, and connectivity to major sources of pedestrians is insufficient. Efforts to instil order brings more conflicts when government agencies discourage stay activities and informalities such as overflow cafes, and street vendors.

Nairobi, a city envisioning a 24-hour economy and one of the leading business hubs in Africa cannot afford to ignore opportunities or to escape the challenges of contemporary urban mobility if it is to prosper providing a high quality of life. Evidence of increased liveliness of the street is apparent in the movement, interactions and congregation of people in streets such as Mama Ngina and Aga Khan Walk. However, the impact on the

economic interests of the traders has not been sufficiently quantified. The ability to initiate steps towards having more carfree streets in the CBD is partly pegged on demonstrating the costs and tangible benefits.

This study contributes to the current body of knowledge by exposing the incongruence between pedestrian's perceptions on their daily use of streets and the priorities of key decision makers such as the Nairobi City Government and the business owners. Nevertheless, as Jalaladdini & Oktay (2013) note, the vitality of public spaces is not based on a single reason but may vary from one street to another; apart from the number of cars, future studies should examine other related influences to the vitality of public spaces in the city. Since this study relied on one city, future studies on carfree schemes for other developing and developed countries are necessary in order to clarify the key influences on perceptions towards safety, comfort and convenience, and connectivity.

Chapter 5: Mobility, Space, and Community: a study on the importance of Tokyo's carfree local shopping streets as social spaces for residents.

5.1 Introduction to Tokyo's shopping streets

Local shopping streets in Japan, also known as *Shotengai* generally comprise of a line of shops such as noodle shops, butcheries, confectionaries, beauty parlours and boutiques. For centuries, they have been central to the lives of local communities. These shopping streets serve purposes beyond the mere shopping and mobility that they were established for: to many residents of adjacent neighbourhoods, strolling, emergent interactions, children's play, events and festivals transform the significance of these streets into valuable community spaces. The wide assortments and the traditional feel of shopping streets are key attractions to locals and tourists in pursuit of shopping and strolling. Minimalised motorisation is an added advantage—many shopping streets have carfree hours especially in the evenings and weekends; some of the shotengai are covered arcades and cars are excluded.

Carfree shopping streets enhance a safe and comfortable environment for local communities to shop, interact, play, and carry out events and festivals. As Watson (2009) posits, markets are public spaces that offer a platform for a variety of social interactions. The frequent encounters among residents for various objectives produces relationships with the space; coincident or deliberate, positive or negative, an understanding of these relationships is critical to planners interested in human-environment relationships in urban streets. Gehl, Gemzoe & Rogers (2006) posit that as compared to the past where it was necessary to utilize the street spaces, people are no longer required to visit the shopping streets to fulfil their daily needs. This challenges the local shopping streets ability to offer a platform for leisure activities and general *pleasure.* Unfortunately, just like the large-scale malls, with more dispersed mobility patterns, the local shopping street

becomes a mere shopping venue, filled with strangers only keen on the exchange value entrenched in the buying and selling of commodities and services. Tokyo and its surrounding areas continue to experience an upsurge of malls such as Aeon, Marui and Itoyokado, as well as smaller supermarkets in the suburbs that are competing with traditional establishments on the shopping street. Furthermore, the ease and convenience brought up by the efficient public transport system in Tokyo, as well as the use of private cars, adds to the continued neglect of the local street and the build-up of moving and parked cars along Shotengai. The impact of the car on local market streets is thus two-pronged; it has redistributed people to distant shopping destinations while at the same time invading the safety and comfort of the local space.

5.1.1 Significance of the study

There have been isolated studies on shopping streets and pedestrianisation from the economic and mobility perspectives; the underlying relationships and contradictions regarding the local community have however remained unclear. Although mobility is more universal across continents, the intricacies in the use and production of social space in Tokyo's local shopping streets is unique but has not been thoroughly examined. This study attempts to bring a more holistic view of the significance of shopping streets to the local community as well as the deficiencies and contradictions in the spatial configuration. We presuppose that with improvement of the quality of the street and the socio-cultural activities therein, these streets can be sustainable and able to survive the onslaught from malls. As such, an understanding of the intricate underlying issues among residents is necessary. We suppose that the status of the local shopping street is guarded by the movement of people (mobility), the use of the street as an urban open space, and

the affairs of the local community. At the same time, the street is at the centre of contestations among various elements of mobility, activities (functional and recreational) of the community, and the quality of the open space.

The current understanding relies on fragments of research efforts targeted at particular aspects of streets such as studies on walking speed (Matsumoto, Kiyota & Ito, 2009), studies related to the use of streets by elderly people (Sone & Kayama, 2009; Borst, Miedema, Vries, Graham, & Dongen, 2008; Tsuboi & Kitano, 2010) and the influence of streets environment on physical activities and public health (Borst et al, 2008). Although shopping streets support day-to-day livelihoods of residents, and a unique shopping experience for visitors in Tokyo, they are suffering serious decline. The decline of Shotengai in favour of shopping malls is a worrying problem in recent years: 32.7% of Shotengai in Japan are experiencing decline, 37.6% are stagnating but likely to decline, and only 1.6% of Shopping Streets are prospering (Torii, Okada, Niwa, Onogi & Ishii, 2010). The upsurge of huge shopping malls and the multinationals they host has been key to the reducing significance of shopping streets all over the world (Watson, 2009; Ozuduru, Varol, & Ercoskun, 2012). Additionally, with improved Information Technology and consumer cooperatives in Japan, the need to visit the local shopping street is being reduced by the convenient growth of ordering from, and delivery to homes (Ozawa & Kishimoto, 2014; Gehrt, Onzo, Fujita & Rajan, 2007; Moen, 2000).

5.1.2 Influence of physical characteristics of shopping streets in preferences for daily goods and services in local neighbourhoods

Studies have shown that the major pull factors in shopping areas are agglomeration

benefits such as enabling consumers to make purchases of assorted goods and services in the same location (Teller, 2008). Evolved Agglomeration Formats (EAF) common in Central Business Districts and major streets consist of independent real estate owners whose participation in the community of agglomeration units is voluntary, while Created Agglomeration Formats (CAF) such as big malls that have additional benefits such as centralised promotions, air-conditioning, car parking, and toilets. Shopping streets are also unsuitable for physically challenged people such as wheelchair users compared to malls (Bromley, Matthews, & Thomas, 2007). However, where the quality and assortment of daily-use goods is high, people tend to choose the shopping areas closest to their homes (Cannuscio, Tappe, Hillier, Buttenheim, Karpyn & Glanz, 2013). Observations carried out on popular shopping streets open to the sky such as Togoshi Ginza in Shinagawa and Yanaka Ginza in Taito ward as well as covered shopping streets such as Koenji Pal Street and Pearl shopping Centre in Suginami ward do not show meaningful impacts of roofs in the popularity of shopping streets when compared to others in their immediate context. As such, although covered streets offer an additional advantage during extreme weather conditions, their influence on choice of shopping places has little significance for residents' in the immediate surroundings.

5.2. The Study

Following a review of literature, exploration of the spatial structure, social interactions, relationship, and contradictions on various local shopping streets in Tokyo, an analysis of the key fieldwork issues and players (such as residents and traders) was carried out. The study aimed at unearthing the underlying relationships between residents' attributes and adjacent shopping streets in Tokyo, and how urban planners can contribute to their

revitalisation and sustainability. As such, the study was structured to achieve the following objectives:

I. To evaluate the day to day importance of the local carfree shopping street to residents
II. To expound on the nature of social interactions on the carfree street space

To evaluate the importance of the local street, we examined residents' frequency of visiting the street. To expound on the nature of social interactions, we examined (1) residents' view on the importance of social interactions on the street, and (2) the frequency of meeting acquaintances.

5.2.1 Study area and methodology

To achieve the objectives above, we considered streets with differing physical characteristics and varying levels of carfree environments across Tokyo. Ultimately, two case studies were selected: Honcho Dori street in Adachi Ward, and Pearl Centre street in Suginami Ward. Honcho Dori is a typical shopping street near Kita Senju station; it is carfree from 16:00-18:00 on weekdays and 12:00-18:00 on weekends and public holidays. On the other hand, Pear Centre is fully pedestrianized, and is one of Tokyo's most famous arcades.

Flyvbjerg (2006) notes that the closeness of a case study to real life situations helps to create a nuanced view of reality. Yin (2014) mentions that the need for a case study emanates from the desire to understand a complex social phenomenon and is one that allows for a holistic and real-world view. We conducted a pilot study that included basic

observation on the streets, and later a test survey on fifteen respondents. The survey questionnaire was then revised; for example, the number of choices on activities carried out on shopping streets as well as items shopped was revised. To understand the perception of traders on the street, questionnaires were administered on traders operating businesses in stores along Honcho Dori; a total of 21 responses were analysed.

In the main survey, 2000 questionnaires (1000 in each case) were distributed by inserting them in mailboxes of residences in the vicinity of the two streets. Residents replied through mail using designated return envelopes. In total, questionnaires from 256 respondents were received (170 in Pearl Centre, 86 for Honcho-dori). For data analysis, we firstly undertook descriptive statistics to describe the fundamental attributes of the data using SPSS software. Secondly, we undertook cross tabulation of the relationship between variables. To test the significance of various variables on 'the frequency of visiting the street,' 'importance of interactions,' and 'frequency of meeting acquaintances,' the cross-tabulation data was used for association tests to obtain the level of significance, p value.

Case 1: Pearl Centre Shopping Street

Pearl centre (figure 5.1) is one of the most famous covered shopping streets in Tokyo it is popular for household goods, as well as annual events such as the Tanabata Festival and the Asagaya Jazz festival. With a width of 5 metres, it starts from the Asagaya JR station in Suginami ward, West Tokyo and stretches southwards for 500 metres (figure 5.2). The street has been carfree since 1952 when the neighbouring Nakasugi-doro street was constructed (Ibuse, 1987), and cyclists are limited to pushing their bicycles while on

the street. It initially consisted of mainly traditional Japanese stores and restaurants that are being replaced by modern establishments such convenience stores and smart phone shops.

Figure 5. 1: Pearl Centre street in Suginami ward, Tokyo. Source: Author

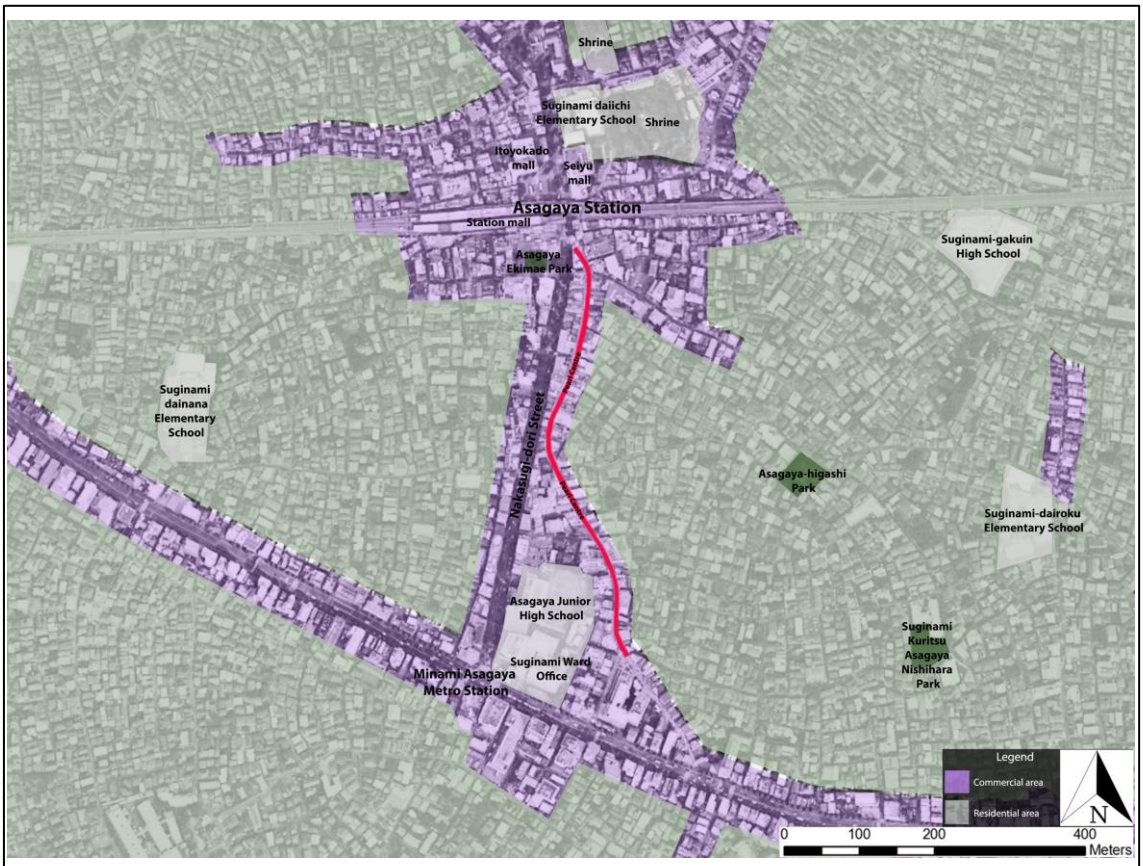

Figure 5. 2: Contextual location of Pearl Centre shopping street in relation to the Asagaya station

The shop owners' association has a centralised website with links to all the businesses on the street. On most days, it is crowded with shoppers on foot and those pushing their bicycles, as well as traders and merchandise displayed outside; the situation worsens during popular festivals. Residents of surrounding areas live in both detached houses and multi-household houses such as apartments. The area of one-kilometre radius around Asagaya railway station has a population of 51,017 people and 25,833 households; residents living alone constitute 64.28%; those aged above 70 years consist of 17.31% of the population (https://storestrategy.jp).

Case 2: Honcho-Dori shopping Street

The Honcho-dori is a 10-metre-wide street that begins 180 metres off the West exit of the Kita Senju Station in Tokyo's Adachi ward, and stretches southwards for 400 meters. It consists of a line of restaurants, grocery shops, and flower shops among others (figure 5.3 and figure 5.4). Honcho-dori is carfree on Saturdays, Sundays, and public holidays from 1300HRS to 1800HRS as well as 1600HRS to 1800HRS on weekdays. Other times, it is used by motorists, pedestrians, and cyclists. However, the street is partially obstructed by utility poles, bicycles and merchandise on display. During Edo era, Adachi ward was host to the Senju-shuku, a post station on the Nikko kaido and the Mito Kaido, part of the five routes that connected Edo (present day Tokyo) to outer provinces during; Honcho dori street was a section of the Nikko Kaido.

The surrounding area is a traditional Japanese downtown with many narrow alleys known as roji that connect small business such as restaurants, bars as well as homes to the main streets. The establishment of education institutions including universities has increased the number of young non-locals, a situation that has disrupted the conventional street fabric that mainly consisted of residents who have lived in the area for many years. The street is also experiencing problems related to unregulated use and parking of bicycles, limited smoking zones, and littering. The area within one kilometre radius around Kita-senju railway station has a population of 64,679 people and 39,619 households; residents living alone constitute 47.8%; those aged above 70 years consist of 16.64% of the population (https://storestrategy.jp.)

Figure 5. 3: Honcho-dori street in Adachi Ward

Figure 5. 4: Contextual location of Honcho-dori Street in relation to the Kita-senju Station

5.3. Results

5.3.1 Characteristics of respondents.

There were no major discrepancies in respondents' attributes across the two cases. However, there were more female than male respondents for both Pearl Centre and Honcho-dori streets (figure 5.5). A One-way ANOVA test of variance was done to test the significance ($p \leq 0.05$) of the variance of means of measured variables. There was no significant variance in means for gender (male F=1.803, df=1,239; p= 0.181 and female F=.544, df=1,240, p= 0.462) as shown in table 5.1

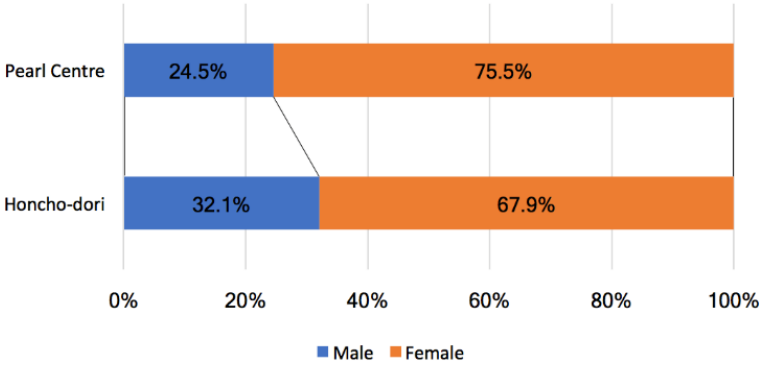

Figure 5. 5: Gender of respondents

Table 5. 1: One-way ANOVA analysis of gender differences

		N	Mean	Std. Dev	df	F	p
Male	Honcho	79	.33	.473	1-239	1.803	0.181
	Pearl	162	.25	.433			
Female	Honcho	78	.71	.459	1-240	0.544	0.462
	Pearl	164	.75	.434			

Among the age groups, respondents aged 70 years and above form the greatest category (figure 5.6). Except for the 20s age-group, there was no significant variances in means for age of respondents (less than 20 years F=0.235, p=0.629; 20s age group (F=3.880, p=0.050), 30s (F=0.453, p=0.502); 40s (F=2.103, p=0.149); 50s (F=1.824, p=0.178); 60s (F=0.009, p=0.926); 70 years-old and above (F=1.941, p=0.165) as shown in table 5.2.

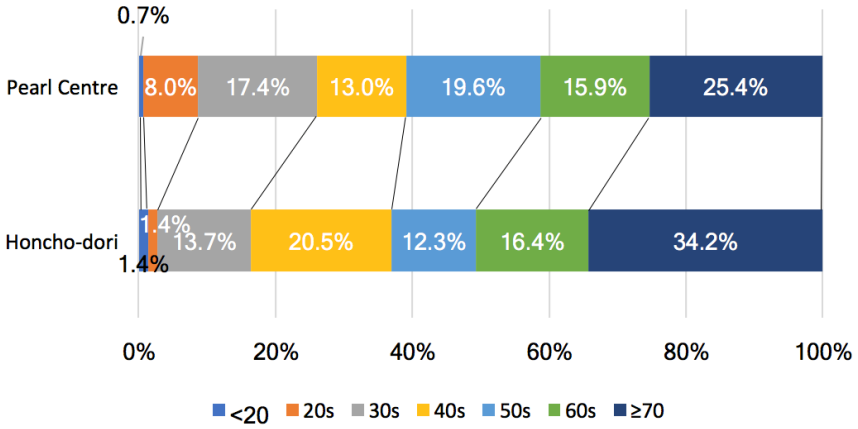

Figure 5. 6: Age of respondents

Table 5. 2: One-way ANOVA analysis of age differences

		N	Mean	Std. Dev	df	F	p
<20years	Honcho	71	.01	.119	1-208	.235	.629
	Pearl	139	.01	.085			
20s	Honcho	72	.01	.118	1-207	3.880	.050
	Pearl	137	.08	.273			
30s	Honcho	72	.14	.348	1-207	.453	.502
	Pearl	137	.18	.382			
40s	Honcho	72	.21	.409	1-207	2.103	.149
	Pearl	137	.13	.339			
50s	Honcho	73	.12	.331	1-208	1.824	.178
	Pearl	137	.20	.399			
60s	Honcho	73	.16	.373	1-209	.009	.926
	Pearl	138	.16	.367			
≥70	Honcho	72	.35	.479	-,207	1.941	.165
	Pearl	137	.26	.438			

Additionally, most respondents in this study live within less than ten minutes to the street (figure 5.7). There was significant variances in means for proximity to the street (minutes taken to the street) for the two cases for close distances compared to respondents living further from the street: utmost 5 minutes (F=7.389, p=0.007); 5 to 10 minutes (F=4.931, p=0.027); 10 to 15 minutes (F=0.587; p=0.444), more than 15 minutes (F=0.468, p=0.495) as shown in table 5.3.

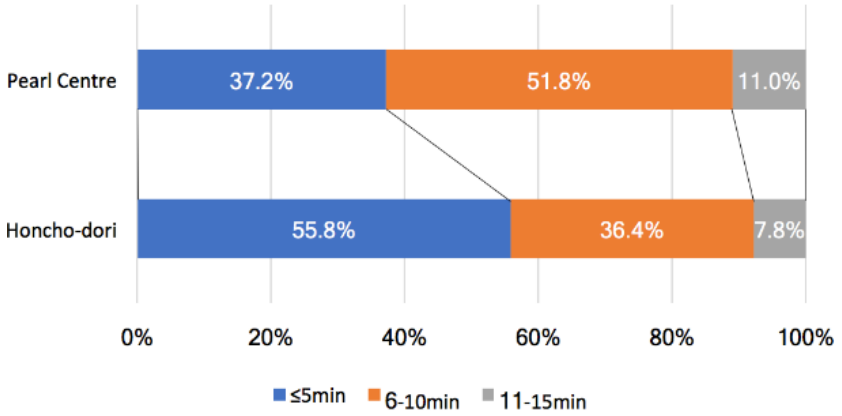

Figure 5. 7: Proximity of street to resident's home

Table 5. 3: One-way ANOVA analysis of proximity

		N	Mean	Std. Dev	df	F	p
<5 mins	Honcho	77	.56	.500	1-238	7.389	.007
	Pearl	163	.37	.485			
5-10mins	Honcho	76	.37	.486	1-237	4.931	.027
	Pearl	163	.52	.501			
10-15mins	Honcho	76	.08	.271	1-236	.587	.444
	Pearl	162	.11	.315			
>15 mins	Honcho	76	.00	.000	1-236	.468	.495
	Pearl	162	.01	.079			

Most respondents have lived in the street's vicinity for ten years or more (figure 5.8). Regarding years lived in the current residence , all categories did not have a significant variance of means across the two groups: less than one year (F=0.025, p=0.875), 1 to two years (F=0.036, p=0.849), 2 to 5 years (F=2.115, p=0.147), 5 to 10 years (F=1.028, p=0.312), and more than 10 years (F=0.083, p=0.773) as shown in table 5.4.

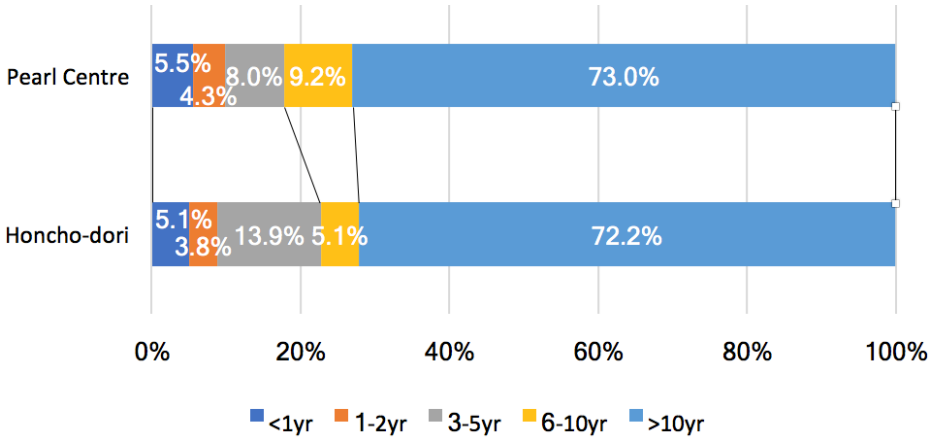

Figure 5. 8: Length of time lived in current residence

Table 5. 4: One-way ANOVA analysis of proximity

		N	Mean	Std. Dev	df	F	p
<1 year	Honcho	78	.05	.222	1-236	.025	.875
	Pearl	160	.06	.231			
1-2 years	Honcho	78	.04	.194	1-236	.036	.849
	Pearl	160	.04	.205			
2-5 years	Honcho	78	.14	.350	1-237	2.115	.147
	Pearl	161	.08	.273			
5-10years	Honcho	78	.05	.222	1-234	1.028	.312
	Pearl	158	.09	.285			
>10 years	Honcho	79	.72	.451	1-238	.083	.773
	Pearl	161	.74	.440			

5.3.2 Importance of local shopping street to residents

In both case studies, the biggest proportion of respondents utilise the street daily, followed by weekly and monthly. However, the percentage of daily visits in Honcho-dori (67.1%) are higher than Pearl Centre (41.8%) as shown in figure 5.9. The differences across the two streets were statistically significant except for monthly F(df=1-248)=0.054.

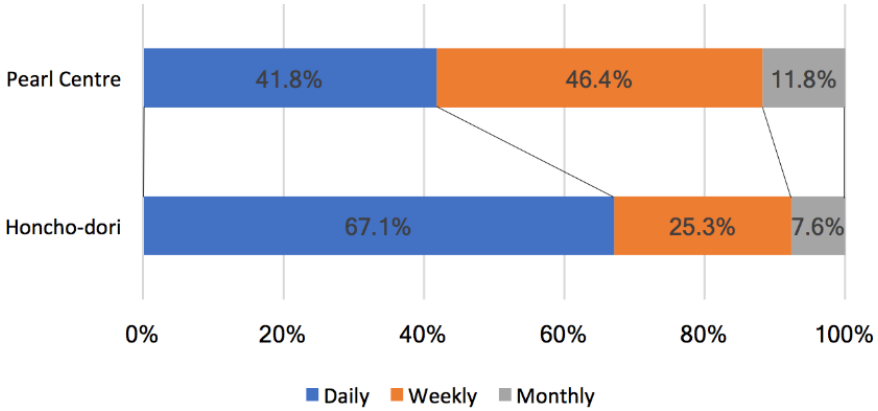

Figure 5. 9: frequency of visiting the street

Table 5. 5: One-way ANOVA analysis of Frequency of using the street

		N	Mean	Std. Dev	df	F	p
Daily	Honcho	85	.62	.487	1-248	13.066	.000
	Pearl	165	.39	.489			
Weekly	Honcho	85	.24	.427	1-248	9.492	.002
	Pearl	165	.43	.497			
Monthly	Honcho	85	.07	.258	1-248	.954	.330
	Pearl	165	.11	.313			

The main objective of visiting the street is shopping; however, the percentage of respondents who go to the street for socialisation and socialising is slightly higher in Honcho-dori (6.8%) compared to Pearl centre (4.6%) as shown in Figure 5.10. However, all the differences in objectives across the two streets were not statistically significant (table 5.6)

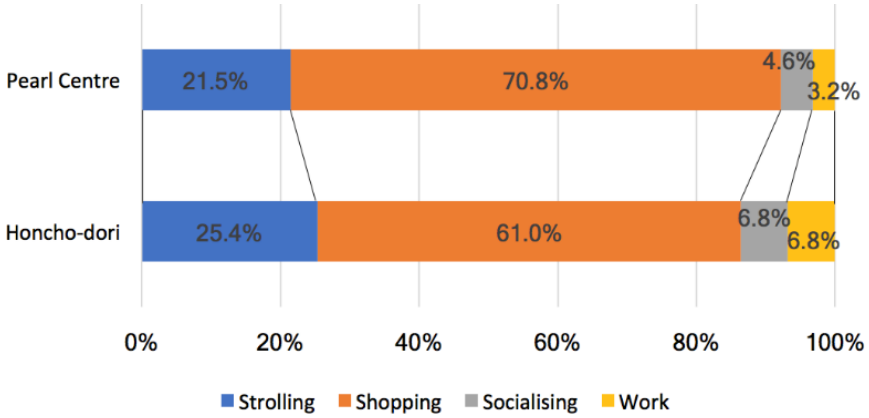

Figure 5. 10: objective of visiting the street

Table 5. 6: One-way ANOVA analysis of Frequency of visiting the street

		N	Mean	Std. Dev	df	F	p
Strolling	Honcho	82	.37	.485	1-246	.437	.509
	Pearl	166	.32	.540			
Shopping	Honcho	82	.88	.329	1-246	2.198	.139
	Pearl	166	.93	.249			
Socialising	Honcho	82	.10	.299	1-246	.198	.656
	Pearl	166	.08	.330			
Work	Honcho	82	.10	.299	1-246	2.975	.086
	Pearl	166	.04	.202			

The main advantage of the street, the reason why residents prefer the street is its proximity to their homes followed by the availability of centralised assortment. Although marginal, the percentage of respondents citing carfree as a reason is higher in Pearl Centre which is permanently carfree as shown in figure 5.11. None of the differences is statistically significant except the advantage “because the street is carfree.”

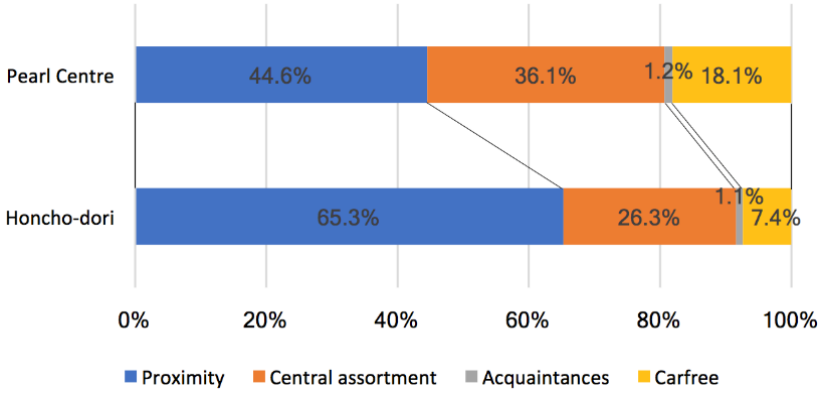

Figure 5. 11: advantage of the street over others

Table 5. 7: One-way ANOVA analysis of Advantages of the street

		N	Mean	Std. Dev	df	F	p
Proximity to home	Honcho	81	.77	.426	1-240	1.524	.218
	Pearl	161	.69	.464			
Centralised assortment	Honcho	80	.31	.466	1-240	13.277	.000
	Pearl	162	.56	.498			
May meet Acquaintances	Honcho	80	.01	.112	1-240	.118	.731
	Pearl	162	.02	.135			
Carfree	Honcho	80	.09	.284	1-240	11.966	.001
	Pearl	162	.28	.449			

5.3.3 Social activities on the street

Many respondents take a neutral view on the importance of social interactions on the street space while those that think social interactions on the street are very important form the smallest category. However, there is a higher tendency for residents around Honcho-dori to perceive social interactions as important compared to residents around Pearl Centre (figure 5.11). Differences in the two streets are statistically significant for the variables “I think interactions are important,” “Neutral,” and “interactions are not important” as shown in table 5.8.

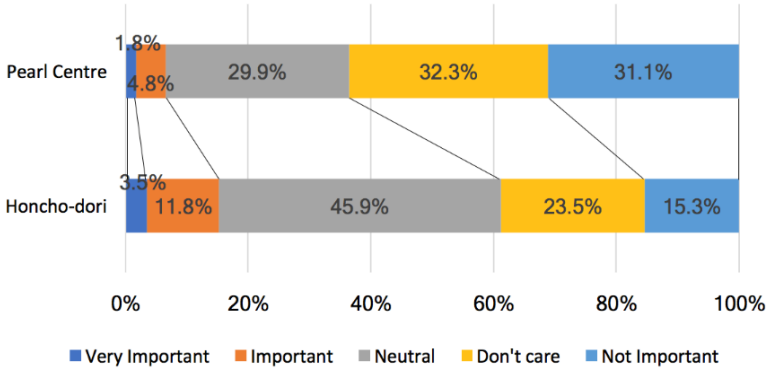

Figure 5. 12: importabce of social interactions on the street

Table 5. 8: One-way ANOVA analysis of "importance of interactions"

		N	Mean	Std. Dev	df	F	p
Interactions are very important	Honcho	84	.04	.187	1-248	.737	.391
	Pearl	166	.02	.134			
Thinks interactions are important	Honcho	83	.12	.328	1-247	4.352	.038
	Pearl	166	.05	.215			
Neutral	Honcho	85	.46	.501	1-249	6.205	.013
	Pearl	166	.30	.460			
I do not care about interactions	Honcho	86	.23	.425	1-250	2.352	.126
	Pearl	166	.33	.470			
Interactions are not important	Honcho	85	.15	.362	1-250	7.550	.006
	Pearl	167	.31	.464			

Regarding the frequency of meeting acquaintances, a majority of the respondents meet acquaintances sometimes, while only a small percentage meets acquaintance always as shown in figure 5.13. Differences in the two streets are statistically significant for “I always meets acquaintances” as shown in table 5.9.

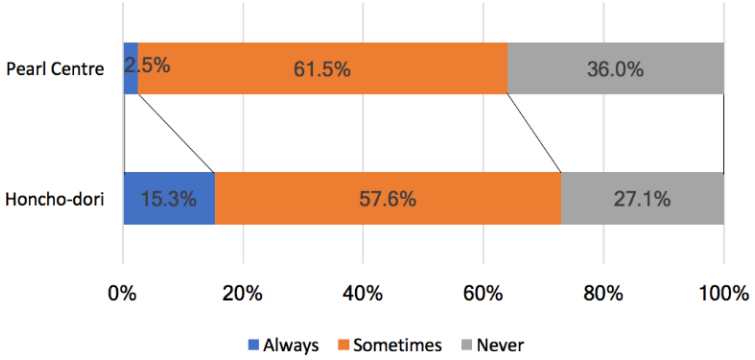

Figure 5. 13: frequency of meeting acquaintances

Table 5. 9: One-way ANOVA analysis of "frequency of meeting acquaintances"

		N	Mean	Std. Dev	df	F	p
Always meets acquaintances	Honcho	83	.16	.366	1-242	10.076	.002
	Pearl	161	.04	.220			
Meets acquaintances sometimes	Honcho	84	.58	.496	1-244	.177	.675
	Pearl	162	.61	.489			
Never meets acquaintances	Honcho	83	.28	.450	1-243	1.621	.204
	Pearl	162	.36	.481			

5.3.4 Inconveniences

Although excessive bicycles, crowding, and lack of sitting space are the key concerns in both cases, lack of bicycle parking is however a greater concern in Pearl Centre (21.6%) compared to Honcho-dori (1.4%) as shown in Figure 5.14. Only the differences for "excessive bicycles" and "lack of bicycle parking" are statistically significant across the two streets.

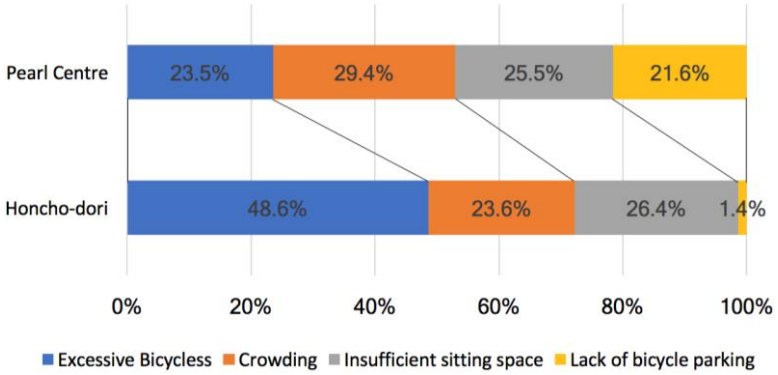

Figure 5. 14: inconveniences

Table 5. 10: One-way ANOVA analysis of inconveniences

		N	Mean	Std. Dev	df	F	p
Excessive bicycles	Honcho	70	.56	.651	1-189	22.242	.000
	Pearl	121	.20	.400			
Crowding	Honcho	68	.25	.436	1-187	.001	.975
	Pearl	121	.25	.434			
Insufficient sitting space	Honcho	68	.28	.452	1-187	.027	.870
	Pearl	121	.26	.668			
Lack of bicycle parking	Honcho	68	.01	.121	1-187	11.975	.001
	Pearl	121	.18	.387			

5.3.5 Alternatives

Among the alternatives, the key places are large shopping malls such as Lumine and Marui near Honcho-dori, Seiyu and Itoyokado near Pearl Centre. Other places such as alternative shopping streets were also mentioned such as Gakuen-dori near Honcho-dori as well as Kita-guchi Shotengai in Asagaya. Top on the reasons for choosing alternative places is the availability of a centralized assortment in the same building, followed by the presence of elevators and escalators in the buildings (figure 5.14). Only the differences in the influence of elevators and escalators are statistically significant (table 5.11).

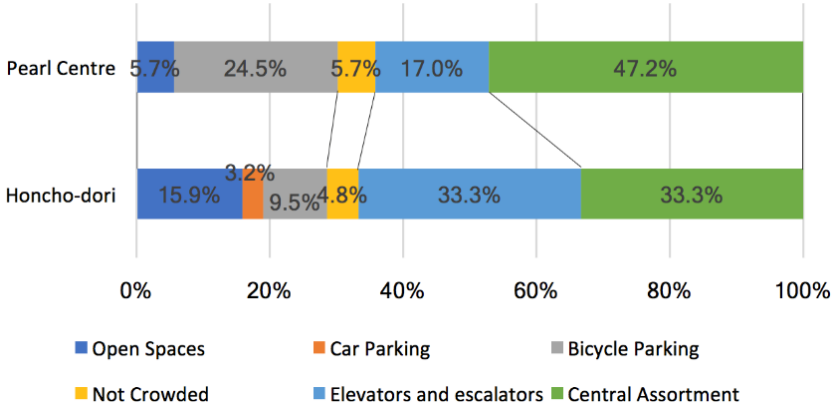

Figure 5. 15: advantages of alternative shopping areas

Table 5. 11: One-way ANOVA analysis of Alternatives

		N	Mean	Std. Dev	df	F	p
Open spaces	Honcho	63	.16	.368	1-135	.121	.728
	Pearl	74	.22	1.264			
Car parking	Honcho	64	.03	.175	1-136	.896	.346
	Pearl	74	.18	1.209			
Bicycle parking	Honcho	64	.09	.294	1-136	1.939	.166
	Pearl	74	.18	.383			
Not crowded	Honcho	63	.05	.215	1-135	.040	.842
	Pearl	74	.04	.199			
Elevators and escalators	Honcho	64	.33	.473	1-136	9.041	.003
	Pearl	74	.12	.329			
Central assortment	Honcho	63	.33	.475	1-135	.003	.956
	Pearl	74	.34	.476			

5.3.6 Full-time pedestrianisation of Honcho-dori

Regarding changing Honcho-Dori into a fulltime carfree street, most respondents would prefer the conversion of the shopping street into a permanent carfree street (63%, n=47) while respondents who prefer that the street remains temporally carfree constitute 37% (n=28).

The major reasons for preferring fulltime pedestrianisation generally involve safety; comments such as "it will be comfortable," and "to be able to walk with children" are indications to this. Concerns by those opposed to fulltime pedestrianisation generally fall into two categories: inconveniences brought by car restrictions, and bad manners associated with liberal carfree streets. Comments supporting this include "annoying for people with luggage," "to allow for shop deliveries," and that "manners of cyclists and pedestrians will worsen…"

5.3.7 Variables explaining the frequency of visiting local shopping streets.

For pearl Centre, the 'importance of interactions,' 'frequency of meeting acquaintances,' 'reasons for choosing alternatives,' 'years lived,' and 'minutes to the street' are significant in determining the frequency of visiting the street. In the case of Honcho-dori, only the 'frequency of meeting acquaintances' and 'minutes to the street,' have a significant relationship with the frequency of visiting the street as shown in table 5.1

Table 5. 12:Significance of various variables in determining the frequency of visiting a street

	Significance	
Variable	Pearl Centre	Honcho-dori
Importance of interactions	*0.035***	*0.100*
Objective of visit	*0.368*	*0.725*
Advantage of street	*0.423*	*0.749*
Frequency of meeting acquaintances	*0.008****	*0.002****

Inconveniences	*0.838*	*0.215*
Reason for choosing alternatives	*0.036***	*0.993*
Years lived	*0.026***	*0.120*
Minutes to the street	*0.040***	*0.034***
Gender	*0.410*	*0.102*
Age	*0.717*	*0.109*

***Note**: *** and **show statistical significance at the 1% and 5% levels respectively.*

5.3.8 Variables explaining the importance of social interactions

For Pearl Centre, only the 'Frequency of visit,' and 'frequency of meeting acquaintances,' were significant in explaining the importance of interactions. For Honcho-dori, the 'frequency of meeting acquaintances,' and the 'age of respondents' were in explaining the same as shown in table 5.2.

Table 5. 13: Significance of various variables on the importance of interactions

	Significance	
Variable	Pearl centre	Honcho-dori
Frequency of visit	0.029**	0.100
Objective of visit	0.080	0.961
Advantage of street	0.219	0.736
Frequency of meeting acquaintances	<0.0001***	< 0.0001***
Inconveniences	0.080	0.520
Reason for choosing alternative	0.278	0.397
Years lived	0.950	0.093
Minutes to street	0.103	0.162
Gender	0.996	0.766
Age	0.576	0.003***

***Note**: *** and ** show statistical significance at the 1% and 5% levels respectively.*

5.3.9 Variables explaining the frequency of meeting acquaintances

For Pearl centre, 'importance of interactions,' 'Inconveniences' 'reason for choosing alternatives,' 'years lived' and 'age' are significant in explaining the frequency of meeting

acquaintances on the street (table 3.5). For Honcho-dori, only 'importance of interactions,' 'years lived' and 'age' are significant in explaining the same (table 3.6).

Table 5. 14: Significance of various variables on frequency of meeting acquaintances

	p value	
Variable	Pearl Centre	Honcho-dori.
Importance of interactions	< 0.0001***	<0.0001***
Objective of visit	*0.121*	*0.246*
Advantage of local street	*0.362*	*0.396*
Inconveniences	*0.033***	*0.270*
Reason for choosing alternative	*0.048***	*0.504*
Years lived	*0.001***	*0.002****
Minutes to street	*0.528*	*0.893*
Gender	*1.000*	*0.797*
Age	<0.0001***	0.028**

***Note**: *** and ** show statistical significance at the 1% and 5% levels respectively.*

5.4 Discussion

In the findings of this paper, we have analysed various attributes of residents around shopping streets in Tokyo, and how these attributes influence the perception and utilisation of the local street as a social space. To begin with, the results affirm the relevance of shopping streets to the lives of those living in the vicinity; this is evident in the prominence of residents' daily visits to the local shopping street in their vicinity, a key source of basic home supplies such as foodstuff. Nonetheless, the objectives of visiting the street are largely constricted to necessary activities of shopping, while optional activities such as strolling and socialising are side-lined in the everyday life of residents. The results suggest that the attachment of residents to the local shopping streets is generally viewed as a mere trading relationship; however, the few who frequent the street place some importance on the street as a local space for social interactions.

It is clear that local shopping streets are being reduced to mere channels and shopping venues, paths connecting residents' homes to various destinations. Only the occasional events such as the Tanabata festival and the Asagaya Jazz festival in Pearl Centre bring out the role of the shopping street as a key urban open space for communal activities. However, the diversity in visitors during such events is not consistent with the character of the local population. Even though some of the residents often meet acquaintances, this has not sufficiently contributed to their social interactions in equal measure. The continued diminishing of local shopping streets' uniqueness, the move towards the uniformity (common with malls) in Pearl Centre, and the invasion of cars and car parking in Honcho-dori are largely responsible for the decreased sense of community. Residents' convenience of easily finding alternative choice venues for social interactions such as coffee shops, as well as the convenience of more centralised assortment and modern facilities lures them into shopping malls.

Between the Pearl Centre and Honcho-dori street, there are clear differences in the perception of residents living in the surroundings. The urbaneness of Honcho Dori notwithstanding, the social interactions are more pronounced compared to Pearl centre as evidenced in resident's regard for interactions, frequency of meeting acquaintances, and their objectives when visiting the street. This may be partially attributed to the population dynamics: people living alone (whose proportion is higher around Pearl Centre) are likely to have less concern for community as compared to those in bigger households.

As one of the most popular shopping streets in Tokyo, Pearl Centre continues to thrive as a shopping and events destination for tourists whereas the social interactions among

residents are marginal. Nevertheless, compared to the Honcho-dori entity made up of largely independent shops, the organization of Pearl as evident in its website that promotes all the businesses makes it more competitive against the assault of malls while unfortunately falling into the globalization trends which have not yet overcome Honcho Dori. The evolution from traditional shops to modern establishments is a great indicator of this globalisation. Although Honcho-dori is faring better, the increasing proportion of 'strangers' population in the local area that has been brought about by increased educational institutions and the proliferation of izakaya (taverns) is a turn off for elderly citizens as revealed in their comments. As one elderly respondent notes "it is becoming like Harajuku (a district famous for pop culture)." This is consistent with Letki (2008) observation on the damages on community bonds caused by diversity and heterogeneity in public open spaces.

The problem of cars in Honcho-dori remains chronic even though there are carfree hours every week. Residents' opinion on the future of cars in Honcho-dori reveals the great contestations on space as people pursue differing interests. Most respondents propose fulltime pedestrianisation of the street majorly due to safety concerns. A big proportion still oppose the permanent removal of cars for the convenience of traders and car owners as well as those carrying heavy luggage; older respondents are more attracted to fulltime carfree than younger ones.

Although there were discrepancies between the two cases, 'frequency of meeting acquaintances' as well as the closeness to the street (minutes to the street) are statistically significant in explaining the frequency of visiting the street in both cases. Additionally,

for Pearl Centre, the years lived, importance of interactions and reason for choosing alternatives were also statistically significant. The importance of social interactions has a statistically significant relationship with the frequency of visiting the street and the frequency of meeting acquaintances in Pearl Centre; for Honcho-dori, only the frequency of meeting acquaintances and age have a statistically significant relationship with the importance of social interactions. In both cases, the likelihood of meeting acquaintances can be significantly explained by residents' view on the importance of interactions, residents' age as well as the number of years lived in the current location. Additionally, for Pearl Centre, it is significantly related to inconveniences and reasons for choosing alternatives. This suggests Pearl Centre's greater sophistication in what residents consider in their day to day life.

5.5 Chapter Conclusions

Is the local Japanese shopping street considered as a significant social space? The study has attempted to answer this question by narrating the global social multiplicities in street spaces, and then assessing the perceptions of residents in two shopping streets in Tokyo. The results suggest marginal significance of the shopping street as a social space for residents. As previous studies have noted (Banerjee, 2001, Gehl et al. 2006) for liveliness and sustainability of streets in the wake of shopping malls and home deliveries, to attract people who may have other alternatives for necessary and optional activities, it will be important to consider streets as open spaces with their quality prioritised rather than viewing them as mere mobility channels.

Streets surrounded by more contemporary households (characterised by single-dweller households) have a lower tendency for being considered as social spaces for the local community. Nevertheless, the variations exhibited across streets of varying characteristics as well as across categories such as gender, age, and proximity to the street point us to a greater hope—with a clear understanding of these intricacies, urban planners can remodel shopping street spaces that spur positive perception to local residents while ensuring functional, safe and comfortable streets in a way that encourages rather than undermine business. Thus, although narrow in scope, this study enriches current urban planning and policy frameworks in Tokyo by injecting a community perspective in a field dominated by paradigms of space and mobility. For future studies, there will be need to establish the peculiarities of each street before administering design and revitalisation proposals.

Chapter 6: A Study on Stay Activities on Carfree Neighborhood Shopping Streets

6.1 Introduction

Whereas the liveliness of a street is often based on the number of pedestrians, the amount of stay activities is an indicator of the quality of the street space. In the Tokyo Metropolitan Area, restriction of cars in the evenings and weekends on shopping streets has been a common phenomenon for decades; the resultant carfree environment increases the safety of pedestrians and allows for a more relaxed shopping experience. Although many studies have evaluated issues of pedestrian movement such as speed and crowding, the status of stay activities such as standing, sitting and children's play remains indeterminate. This study thus theorises carfree streets as open spaces, platforms for various kinds of recreational and social activities.

By observing street activities of residents, workers and visitors in two neighbourhood commercial streets, the study aims at bringing an understanding on how the day-to-day use of space in temporary carfree streets can successfully transition from a mobility channel into a carfree public open space. Observations conducted on Wednesdays seek to bring an understanding of sidewalk use behaviour on weekdays when cars use the street. Observations conducted on carfree Sundays are geared at explaining how people utilize streets as public open spaces in the absence of cars. Finally, events such as playstreet are viewed as initiatives to rekindle the importance of carfree streets as platforms for stay activities.

6.2 Methodology

Structured observation and note taking were used to collect data on activities in two streets: Chuo-dori in Tokyo's Mitaka City and Howdy Mall in Kashiwa City in Chiba Prefecture (figure 6.1).

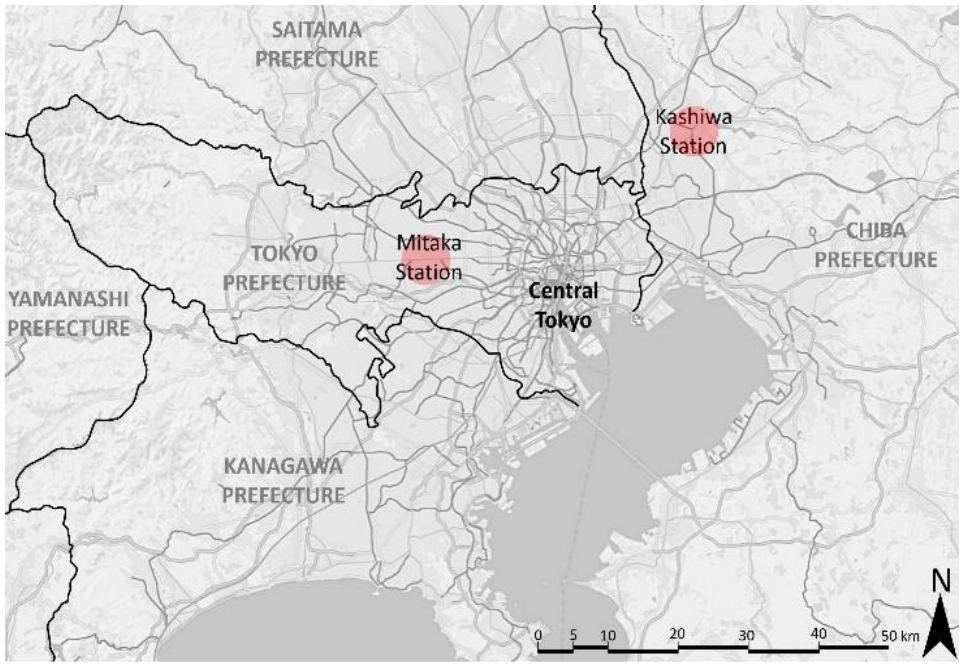

Figure 6. 1: Contextual location of the case studies in relation to Central Tokyo

Both streets are connected to major train stations, are situated in mixed-use neighbourhoods and are dominated by basic establishments such as restaurants, convenience stores, and boutiques although they host other land uses such as residential apartments and banks (figure 6.2 and 6.3). Observations were done every fifteen minutes from 1300hrs to 1600hrs, between Spring and Autumn 2017 in good weather (table 6.1). A total of 13 instances each day were recorded as shown. The location of stay activities was mapped on coding sheets of A3 paper using pre-planned symbols such as dots and crosses for the following activities: adult standing(o), adults in a conversation (•), adult sitting(x), adult doing something (□), child sitting or standing (Δ), and child playing (▲).

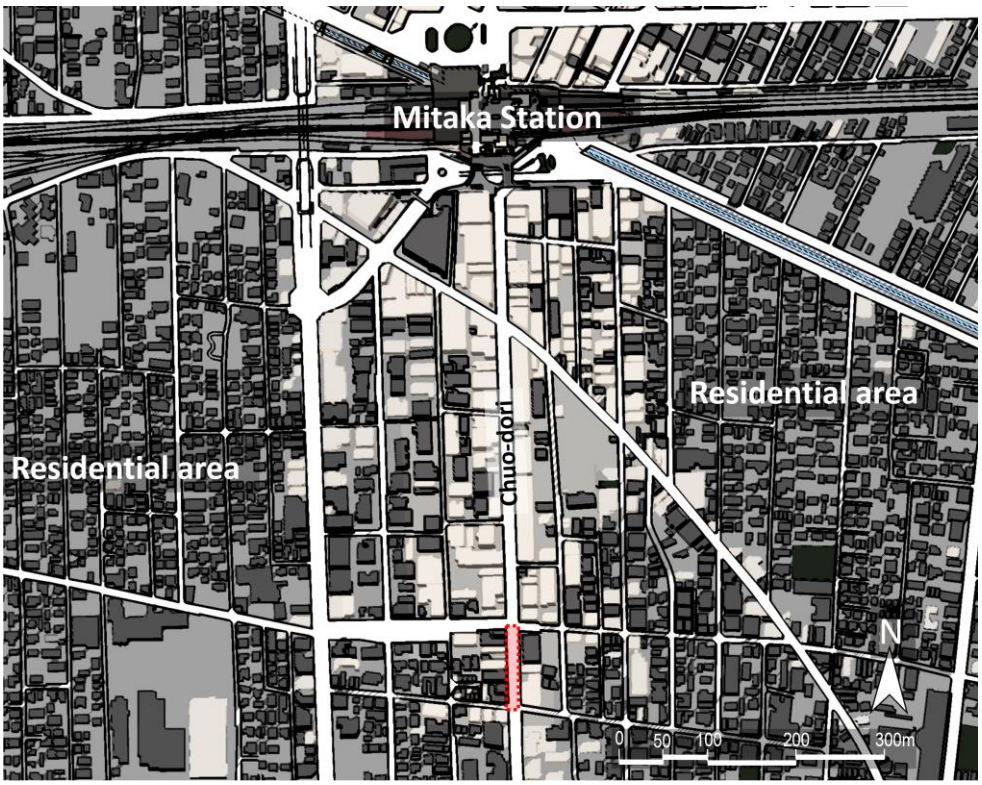

Figure 6. 2: Location of Chuo-dori relative to Mitaka Station

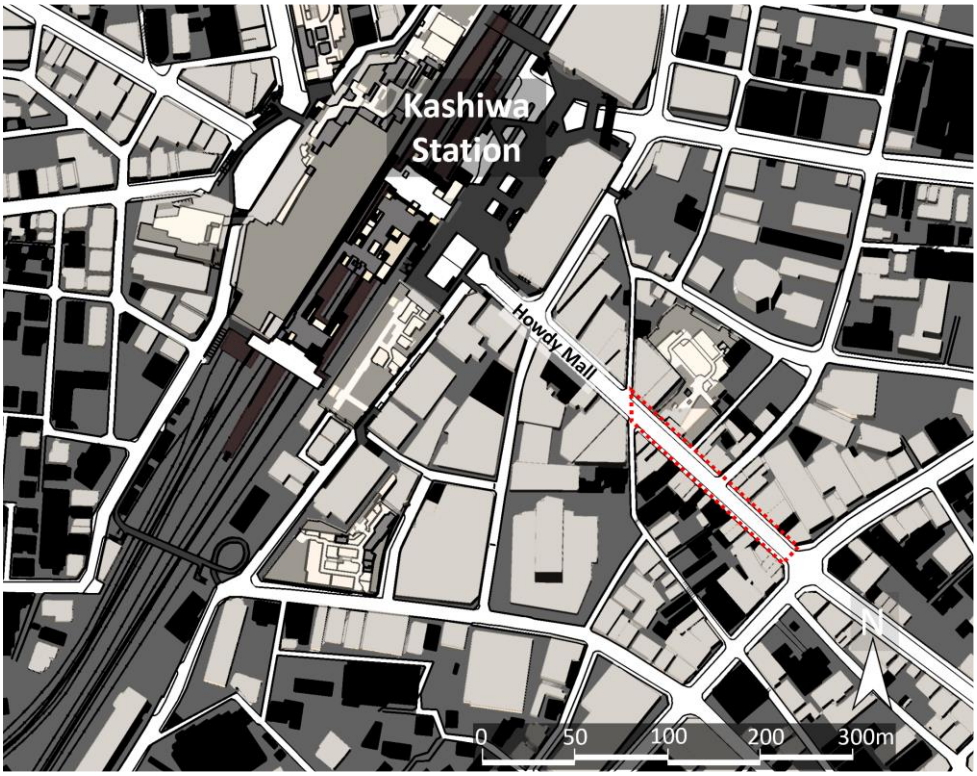

Figure 6. 3: Location of Howdy Mall relative Kashiwa Station

Table 6. 1 Observation schedule

Street name	Weekdays	Ordinary Carfree days	Carfreee Sundays with organized activities
Chuo-Dori	2017-05-31 2017-06-07 2017-07-05	2017-07-09 2017-07-23 2017-08-06	2017-05-28 2017-08-27
Howdy Mall		2017-10-01 2017-10-15	2017-10-08 2017-11-12

The results were enriched by unstructured observation and note-taking carried out during authors' participation in playstreet activities. During crowded events, photography was utilized to complement the manual recording. The data was digitized by remapping the raw data using ArchiCad for more clarity. However, due to very low levels of stay activities in most instances, all instances were combined into a single map for each case to easily visualize the concentration of activities.

Constellations of various activities, their trends and tendencies, and the associations between stay activities and physical surroundings were also identified. Examination of the physical characteristics that influence the location of stay activities on the street was also done. The examination involved the detailed recording of conditions, behaviours and design characteristics of each street: the dimensions of the street, street furniture and other facilities, the character of on-street buildings, and the general upkeep of the street. Personalization and permeability of facades were measured through the help of ten professional judges in the fields of Urban Planning and Landscape Architecture. However, when compared to interviews or questionnaires that rely on the response of subjects, a major limitation in this observation-based methodology is in isolating the influence of the carfree conditions on people's decisions against necessary activities that could still have taken place anyway.

6.3 Results

6.3.1 Stay Activities in Chuo-dori

Seemingly, the appropriation of Chuo-dori on weekdays is founded on the respect for the car space and the concentration on shopping activities. Stay activities are generally tied to the business entities through aspects such as window shopping, reading a menu, or buying meat from Andes shop that is open to the street. On ordinary carfree Sundays, although the intensity of activities increases, the space reclaimed from cars is taken by cyclists while activities are still aligned to the sides of the street. Apart from the general increase in the number of people during events, the proportion of adults sitting, doing something, and children playing rises significantly (figures 6.4).

Figure 6. 4: Chuo-dori street on weekdays with cars (top), ordinary carfree days (centre), and organized activities on a Carfree Sunday (bottom)
Source: Author

With only two permanent sitting areas, except for elderly or sickly pedestrians, sitting among adults is only visible during events when temporary sitting is availed and people sit on unconventional elements such as curbs and railings (figure 6.5).

Figure 6. 5: unconventional sitting during organised activities. Source: Author

There are very little emergent conversations among adults triggered by the organized events: conversations are generally restricted to family, friends, and acquaintances as recorded in field notes. The constellation of people during carfree events is influenced by the activity at each station. For example, the huge congregation of children outside the Lifesalon insurance shop is influenced by the kind of play as well as the company's advertisement interests: children engage in play activities whose end is a gift while the staffs get an opportunity to advertise their products to parents and passers-by. The play station outside Puu no mori includes a picture-story show, *kamishibai* organized by puu no mori shop that sells traditional children books. Among spaces outside stores that have many stay activities, the top three are described in table 6.2. Among the six types of

activities examined, weekdays and normal carfree days are dominated by standing, while children play dominates during play events (figure 6.6).

Table 6. 2: influence of shops on stay activities

Andes Meat Shop		Popular for various kinds of meat dishes such as fried chicken. The storefront is fully open to the street and people can buy or do window shopping while standing on the street or sitting on bicycles. The glass cased displays directly face the street, an attraction to passersby. It is brightly colored and labelled in big characters hence noticeable from far.
Delices Bakery		The transparency of the facades encourages congregation of people for short durations. Window shopping and reading the menu for the bakery or the bar upstairs increases the liveliness of the space. Due to its popularity with families, it is a major decision point as people discus the menus outside or wait for each other.
Cycle paradise		Although the permeability and personalization of the space is comparatively low, there are emergent conversations due to the building's function: cyclists talk among themselves as well as with the shop's staff. Additionally, the space is enhanced by the niche offset from the street that serves as a shaded standing space.

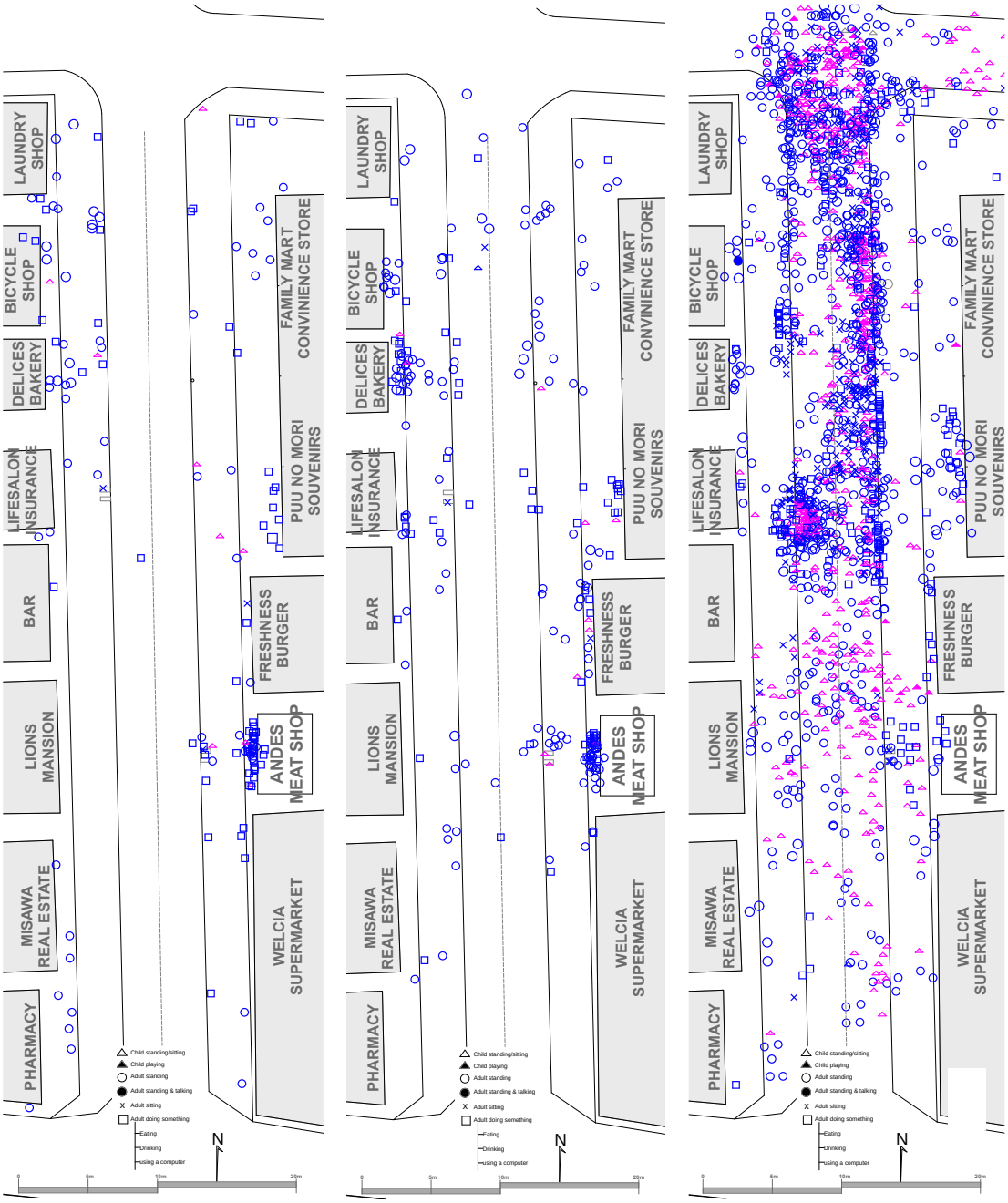

Figure 6. 6: Stay activities on chuo-dori. From left: Wednesdays, ordinary carfree Sunday, and carfree Sunday with an event. Note: all instances (every 15 minutes) were combined to emphasise trends in use of space.

6.3.2 Stay activities in Howdy Mall

On weekdays when cars use the street, stay activities are minimal and limited to the sidewalk. On Sundays when the street is carfree, there is only a slight increase in the number of people using the central space. Major changes are only witnessed during organized activities such as music concerts as shown in figure 6.7, 6.8, and6. 9

Figure 6. 7: Howdy Mall street on weekdays with cars (top), ordinary car-free days (centre), and organized activities on a Carfree Sunday (bottom)

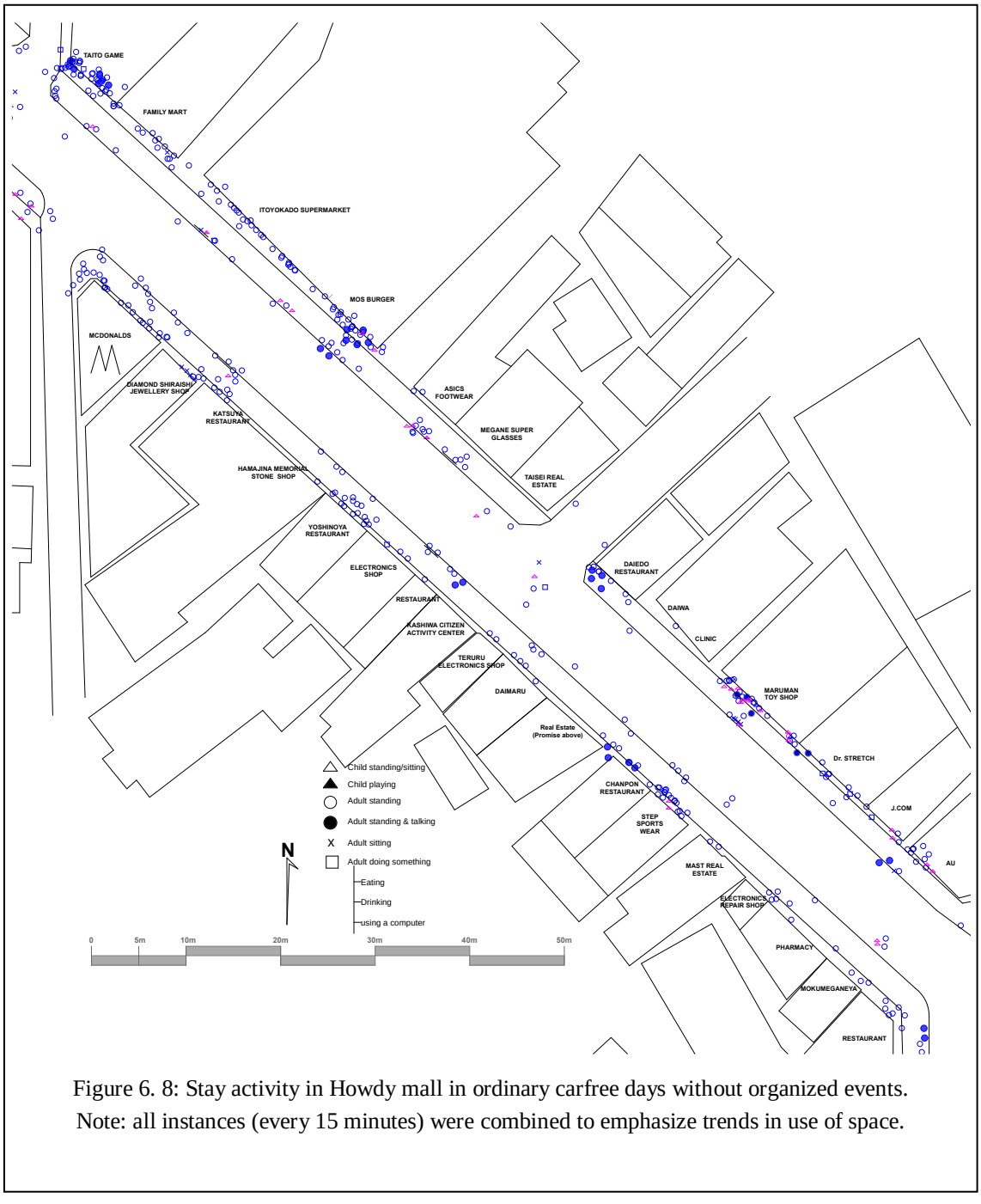

Figure 6. 8: Stay activity in Howdy mall in ordinary carfree days without organized events. Note: all instances (every 15 minutes) were combined to emphasize trends in use of space.

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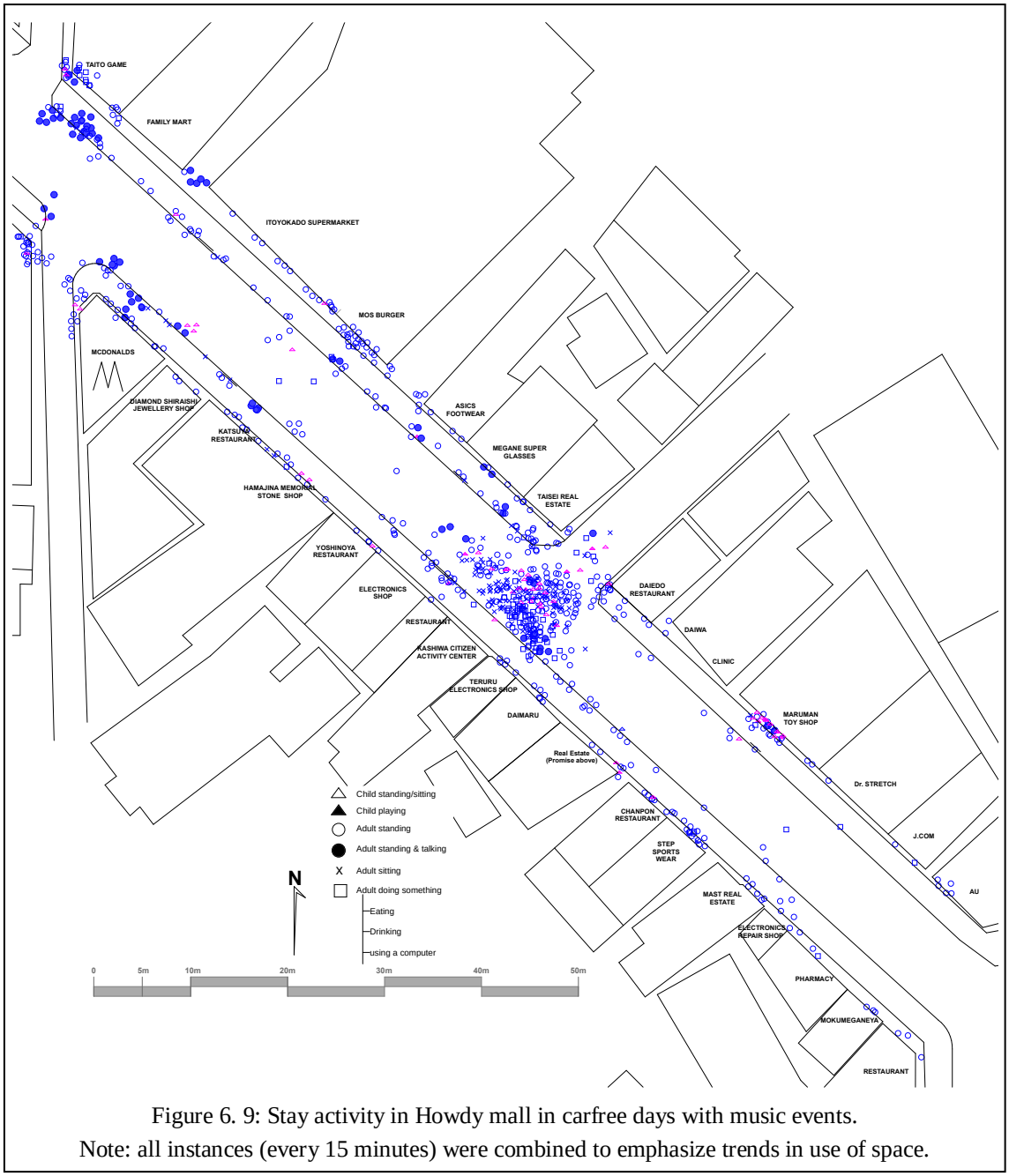

Figure 6. 9: Stay activity in Howdy mall in carfree days with music events.
Note: all instances (every 15 minutes) were combined to emphasize trends in use of space.

There is a significant congregation of people around the music performance area. Generally, stores with information (such as menus) and merchandise outside especially restaurants and convenience stores have a greater pull than others. The variations across user groups have a great effect on space use. For example, children tend to gather outside the Maruman Toy Shop. Additionally, field notes have frequent records of young people

gathering outside the Game Taito Station. There are also clear variations in behaviour based on types of attractions on the street. Even among the music performances, differences are prominent: for example, the rock band attracts more people than the solo performances; younger audiences are also more engaged in the process than older ones. Advertising staff such as those giving pamphlets outside shops are a key contributor to stay activities. For the elderly, most of their activities are for taking rest whereas many couples' stay is part of decision making. High school students are often in groups and improvise street elements such as curbs and bollards for sitting especially near McDonalds and Game Taito Station. Children often utilize the few steel benches for play. They also stop randomly to savor ongoing performances when compared to adults. Most sitting is on bollards, while standing is dominated by window shopping and viewing menus placed outside shops. Tobacco vending machines are additional sources of stay activities. Most people in wheelchairs use the middle of the street, visibly enjoying the liberty of the carfree street. However, the inward orientation of the shops is a clear negative towards the use of open space. An analysis of the most popular spaces reveals that the function, permeability, and personalization of buildings have a great influence on people's outdoor activities as shown on table 6.3.

Table 6. 3: Influence of shops on stay activities in Howdy-mall

Game Taito Station		The gaming arcade is popular among young people including High School students and this contributes to the liveliness of the storefront. The niche on the ground floor as well as staff advertising outside also add into the liveliness.
Mos burger		The openness of the eatery, and the transparent facades attract passers-by. The liveliness adjacent to the storefront is also attributable to people stopping to have a look at the menu displayed outside.
Macdonalds		The fast food restaurant is located at a junction close to the Kashiwa station and hence strategic. It attracts small groups of young people such as high school students to the adjacent walkway space. The cues in the restaurant sometimes outpour onto the street hence increasing the liveliness of the surrounding space.

6.4 Discussion

The results above depict clear differences in the occurrence of stay activities in three situations: weekdays with cars passing, ordinary carfree Sundays, and carfree Sundays with organized activities. Observed stay activities in our findings generally fall into three categories: 1. activities arising from pre-planned attractions such as street play and music performances; 2. Necessary stay activities related to shopping, and elements placed outside of shops, and 3., sporadic stay activities on the street such as a couple stopping briefly in the middle of the street or people squatting to interact with a dog or cat across a glass door. Unfortunately, most organized events that have a significant influence on

the vitality of these streets also require massive preparations and funds while their subsequent influence on the use of carfree space in ordinary days is minimal. The absence of emergent conversations during pre-planned activities shows that individual objectives do not merge into communal activities on the public space. Additionally, the automobile-oriented design and the insufficiency of facilities such as benches on the streets undermine outdoor life. Blocking cars has thus not been succeeded by utilization of the emergent space for stay activities.

The function of stores, character of facades, and availability of niches are key in the occurrence of stay activities. Moreover, the physical character and function of stores vary depending on the day of the week as well as minor changes in arrangement and activities on the storefront. For example, the open display in Itoyokado Supermarket along Howdy mall changes almost every weekend; selling second-hand CDs and DVDs has a greater contribution to liveliness as compared to selling food. Involvement of business owners in street space includes advertising the events to their customers, funding of play leaders and provision of furniture, organizing stay activities related to their businesses, as well as advertising their business to participants.

There are clear variations in stay activities based on age, gender and other characteristics inherent in street users. For example, undesignated sitting opportunities such as curbs and bollards are generally limited to younger people especially high school students and children while adults only utilize them during organized events. Meanwhile, the innovative use of space for activities such as sitting and eating during events is a strong indication of people's aspirations to use available space. The intent is seemingly frustrated by the lack of incentives necessary to invite people into and to keep them on the street

space. The incentives may include both the physical facilities such as sitting and entertainment screens, but also the presence of other people in stay activities. Children's playstreet, street bar and music performances recorded in this study point to the nature of incentives necessary to maximize street use.

6.5 Conclusion

At the outset of this discourse, the study theorised that temporary restriction of cars presents an opportunity for the reinterpretation of the street space from being a channel for movement into its consideration as an urban open space for stationary activities. The study supposed that observing the transitioning from a car street to a carfree street, and examining the role of organized events on the resultant space is critical in exposing the use of carfree streets as public open spaces. This research shows that even in carfree streets with little outdoor activities, patterns of use can be deciphered by continuous observation and mapping of day-to-day stay activities. The study thus contributes to current knowledge on the micro-scale relationship between carfree street space and stay activities, the implication of organized activities as well as the role of immediate adjacent land uses and their guardians such as shop owners. Ultimately, piecemeal initiatives by residents and shop owners will play a critical role in establishing long-term liveliness of street spaces in a way that is beneficial to businesses and local residents. Future studies on stay activities will be instrumental in demonstrating the adaptability of these observations in other shopping streets in Japan.

Chapter 7: Stay Activities in Tokyo`s Carfree Neighbourhood Shopping Streets

7.1. Introduction and purpose

In response to prevailing challenges of automobile dominance, carfree schemes across the globe have focused on bettering pedestrian movement, enhancing the shopping atmosphere, as well as cultural heritage preservation. Studies on communal stay (non-movement) activities such as children`s play have however been few. Studies have also concentrated on Western countries whose longstanding planning approaches and cultural backgrounds are alien to the context of Japan.

Previous studies demonstrate three things:1, reclamation of street space from cars is only complete if utilized for stay activities such as children play, 2, stay activities on neighbourhood streets are sustainable if undertaken with significant input of the local people, and 3, carfree street space is a complex underlined by public-private conflicts and history that is not apparent at the surface. Therefore, the purpose of this study is to explain the implications of stay activities on carfree streets, to clarify the role of local community members in these activities, and to bring an understanding the underlying issues influencing the sustainability of street activities on carfree streets,

7.2. Methodology

Participant observation of street activities was done on four streets that are carfree on evenings and weekends: Tokkaido street in Shinagawa Ward, Aisome-dori in Bunkyo Ward, Chuo-dori in Mitaka, and Howdy Mall in Kashiwa City in Chiba. The first two streets have few shops and more residential functions in local neighbourhoods while the last two are key shopping streets directly connected to major train stations as shown in table 7.1.

Table 7. 1 Activities in selected streets

Street	Examples of activities
Tokkaido Street, Shinagawa 	●Bi-annual Ninja training for children ●Playstreet activities for children ●Nagasu somen (noodles flowing on bamboo cross-sections) ●Annual Children Halloween Parade ●Tea Ceremony
Aisome dori, Nezu 	●Street movies ●Playstreet for children (every Sunday) ●Play truck (once a month)
Chuo-dori, Mitaka 	●Playstreet for children (a few times every year) ●Music performances ●Outdoor bar during playstreet and music performances ●Various annual festivals
Howdy Mall, Kashiwa 	●Playstreet for children ●Music concerts ●Various annual festivals

Since 2016, the author has been involved in conducting activities for play street, Ninja Play, and communal meals in Tokkaido; play street, street movies, street markets, and play truck in Aisome, as well as occasional play street in Chuo-dori and Howdy Mall. Collaboration with organizations such as Obachanchi[1] in Shinagawa, and Aisome neighborhood Association has built relations with organizers and participants that were very critical in collecting data for this study. While participating in street activities, the

author made observations and informally engaged children and adult participants, and volunteered in activities such as making kakigori (shaved ice dessert). Through direct observation, the situation during events and on normal days when cars use the streets was also examined. As Gehl and Svarre (2013) advised, onsite observation using the senses, common sense, and simple recording on paper is very useful in exposing the realities, details, and trends in how people appropriate space in their daily life. Throughout, field notes and photography helped to give a more nuanced view of reality regarding the nature of activities and the peculiarities of the physical environment.

Between Spring and Autumn 2017, structured interviews with organizers of street activities were done in order to present diverse perspectives of reality while exposing the perceptions, motivations, intents and hidden conflicts in the use of street space. A total of fourteen interviews were done at an average of fifty-six minutes per interview; the shortest interview was twenty-eight minutes and the longest took one hour and twenty-five minutes. In addition to the organizers of street activities, three professors with experience in street activities were also interviewed. The interviews were done in both Japanese and English depending on the interviewee's language abilities. All the interviews were tape-recorded with full consent from the interviewees; they were later transcribed in English. For confidentiality, pseudonyms were used to identify the interviewees; the details are tabulated in the appendices.

7.3. Results

7.3.1 Uniqueness of Street Activities

Figure 7. 1: street market on Aisome street

Figure 7. 2: a communal meal in Tokkaido

In absence of cars, street activities in Tokyo rekindle the authenticity of Japan's traditional culture and community bonds that remain in the background of daily life in the globalized metropolitan. Street activities such as children and adults playing beigoma (spinning top toys) or neighbours feeding on nagashi somen[2] in summer enhance local identities and produce liveliness that cannot be replicated in other urban open spaces (figure 7.1 and figure 7.2). The camaraderie that emerges among participants is key in forging social bonds in the community. For example, field notes from 29th July 2018 note that; "Sakada[3] a youthful community leader in Aisome Street negotiating with a group of children on the timing for changing clothes after playing with water before returning for the street movie in the evening."

Additionally, during street markets in Aisome, children and parents can bring out items from their homes and sell on the street; sale of toys for example creates an interactive environment between local children and visitors. Designation of a street as carfree for certain hours is not sufficient. For example, Haruko[4] bemoans the lack of activities for long periods when Tokkaido street was not utilized: "*Every day in the evening from four to six we stop cars, and Sundays from twelve to six o'clock we stop cars. However, there*

have been some periods of up to two years when they stopped cars but they do not use." This situation has allowed for cars to be permitted back in many streets that were carfree in Tokyo.

In Japan, people's activities on streets generally cover for the lack of focus in architectural forms in streetscapes. According to Shelton (2012; 60), compared to many western cities, streets in Japan are defined by content at the expense of architectural forms; Shelton cites their charm when people are occupying them, and the emptiness of the urban experience when the people retreat. Sakada[3], also has a similar comment about Aisome street: "*The uniqueness of this street is that it is a kind of park on Sundays.*" To Mia[14] who organizes street markets, streets are crucial platforms since they are unavoidable in day-to-day life. To many people, the street is a good platform for activities because of proximity and interlinkage to living areas, a continuity that integrates experiences on the street into daily life. Conversely, parks are seen as disjointed stand-alone spaces even when not very far from residences. For example, while sketching, Prof Yukihiro[5] explains: "…*The street is the common space adjacent to two individual houses or shops. Parks are common spaces but are standing alone…Streets are the spaces where people next to it can shar*e." Proximity is particularly emphasized by the concept of mukosangenryotonari pointed out by Komura[6], a definition of the smallest unit of community: neighbours on both the left and right along the street as well as the three across. This affects issues such as where children play, and has practically been applied in aspects such as responsibilities for cleaning streets from snowfall. Additionally, references to idobatakaigi (well-ended meeting), a word emanating from housewives' use of alley space for chatting as they fetched water and undertook household chores on roji (narrow alleys) asserts the

traditional importance of alleys as community space. Such aspects show unique social attributes of streets that can be rekindled and applied in encouraging usage of streets as open spaces. For Prof Kita7, "…I have two sisters and one brother… and if we are playing outside the house, my mother can take care of us, [and] can watch what kind of play we are doing. But in the park, my mother cannot care for me and my sisters so here is really safe area for play, especially for very small children. It is very important to play in front of the house." Jane Jacobs (1961, 101) also reiterates the role of adults in aiding and protecting children on the street, a role nobody played in parks.

Streets are also seen as more appropriate for activities without prior planning such as getting toys from the house and playing outside, whereas designated spaces such as parks are fitting for more deliberate activities. The parks contain a single purpose—play. Additionally, many people lamented that Tokyo's parks are overly formalized and regulated; they are play spaces managed by city governments, a platform for certain people and activities while at the same time excluding others. In sum, proximity to living areas and adaptability to different usages makes streets preferable platforms for stay activities. To Izawa, Urayama, and Shimizu (2004), part of the challenge in creating lively streets is the lack of manpower to organize street activities such as street cafes. This points to the unfortunate separation of work and leisure in daily life (Lefebvre, 1991) while seeking specialists for each task instead of the local community.

The rationalism of designating specific spaces for specific activities is also evident in the ideology that street as a platform for activities can be replaced by building more parks. Hiro[15] supposes that he played on the street in childhood due to circumstances as evident

in his comment: *"...in those times there were no green parks, but these days we are planning parks within 200 meters.*" The same sentiments are shared by Mura[9] who mentions that he played on streets as a consequence of not having air conditioning at home. Considering the street's usability by children is critical since studies have shown that street environments favourable for children's play also create a platform for adults in society and the community at large to interact (Lacey, 2007; Gill, 2007)

7.3.2 Flexibility of the street and the contestations therein

During street activities, the basic understanding of 'public space' is challenged as the line between "public" and "private" fades. For example, Haruko[4] notes that "s*hop owners have special ownership and interest in the area just outside their shops. Even though the street is public, the frontage of your shop is almost like your private space. They have some sense of control."* For streets with a lesser proportion of shops such as Tokkaido and Aisome, stay activities tend to be small-scale except when there are specialist organisers or active community organisations. Activities also tend to be more unique, and have a greater participation of local residents. Activities such as preparing nagashi somen in Tokkaido and movie screening in Aisome are livelier and enhance greater communication among participants.

For major shopping streets such as Howdy Mall and Chuo-dori, funding is often available from the shotengai for elaborate expert-led initiatives with much equipment but the frequency of holding such activities is low. Special stay activities such as events and festivals are interspersed across the year; they are expensive and require major preparations. Many of the organizers and participants are often people from outside the

community. Ordinary activities are easy and have a cumulative impact over a long period of time; they include placing a bench on the storefront, children drawing on the street surface by chalk, or a group of ladies learning how to conduct a tea ceremony outside a shop. As Komura[6] describes, the current extremes between lively events and total abandonment in ordinary days is an expression of Hare and Ke, the Japanese concept that contrasts the vigor in special days (Hare) with the blandness of ordinary life.

7.3.3 The danger of safety and the rigidity of authorities

Japanese society's unique regard for *safety***,** community order, mutual respect, and fear of conflict is an essential element in the functioning of street activities in neighbourhoods. Compared to other countries where exclusion based on race, economic classes, gender, and age is a key discourse, issues of public space and social interactions are rarely given prominence in Japan. From conversations with residents, many people born after the dominance of automobiles believe that the street belongs to the car, and obstruction is meiwaku (disturbance) thereby avoiding activities that are in conflict with cars, car owners, and other forms of mobility. Additionally, some of the outdoor behaviours either encouraged or tolerated in other societies are abhorred in Japan based on values often inculcated in childhood; this includes sitting on the street. The street is also seen by many as kitenai (dirty) for eating or drinking. For example, Prof Kita[7] recounts that "…*we [Japanese] have no custom to sit down on the street, so we need a chair. We sit down on the road with goza, some kind of seat...*" The interchange between carfree and car days is also problematic. As Mura[8] and Sakada[3] note, little children may not be able to differentiate between carfree days and ordinary days with cars.

Due to perceived safety and security in Japan, criminal incidents have had a great dent on the public's feeling of safety outdoors as compared to other societies. As Ryuu[9] and Misato[10] note, outdoor life has been discouraged by major incidences that have been publicized in Japanese media such as the Miyazaki incident where a man kidnapped and killed young girls, and the Hayashi Curry Incident where poison in a community meal caused deaths and hospitalization of people. Additionally, in what Ryuu[9] calls 'dark history,' major restrictions on use of street space have been influenced by movements and protests in the past. Many rules and attitudes towards street space were also crafted as a direct response to the mushrooming of informality after the Second World War, the student protests in the 1960s, as well as 'public nuisance' such as bosozoku (motorcycle gangs). This dark history has shaped people's perspectives on the use of street space, while authorities have capitalized on it to block possibilities for conflict, and to streamline the street space for smooth flow of cars and pedestrians. Laws such as the Road traffic act[11] have hardened this viewpoint.

Many studies have shown how police in Japan have overwhelming control in the affairs of local streets when compared to other countries (Suzuki & Almazan 2016; Izawa, Urayama, Shimizu, 2004). In practice, street activities need an additional permit from the police unlike other open spaces such as parks. Dimmer (2012; 82) also observes that the Road act defines mobility-related spaces such as streets and promenades as spaces for smooth circulation while ruling out stay activities unless with individual permits for each activity. To get a permit from the police a well-reasoned explanation is of great essence. This frustration is expressed by Haruko[4] commenting on whether children can play on the street in carfree hours: *"…There are restrictions against cars in those hours, and a*

barrier to keep them off…However, the permit is primarily to stop cars, not to do anything on the space. …" In addition to the permit for restricting cars, a permit is needed from the police for undertaking activities such as children's play while a public health permit is necessary for offering food. A permit is also needed for holding street markets. Unfortunately, as Yumiko[12] observes, most Japanese people are not conscious of the difference between main roads and neighborhood streets.

7.3.4 Role of Community Groups in Management of Street Activities

Watanabe (2007) argues that machizukuri (community-based town making) is based on people's desire to appropriate space in accordance to their desired lifestyles as compared to the ideals of the government and market forces. For example, the power of community formations such as chokai (neighbourhood association) and shotengai (shopping street association) enables some residents to undertake guerrilla activities. Police generally trust shotengai and chokai because of their history in society. Some shotengai are also involved in activities such as installation and maintenance of street lights. Unfortunately, as Sorenson (2002) reports, they are often led by the elderly and focus on disseminating information from the local authority to the citizenry; their role in organizing activities such as children's play is rare. In the same breadth, Sakada[3] attributes the vitality of Aisome to young members of community who can bring new ideas compared to older leaders who organized activities as a responsibility. Meanwhile, Prof Yukihiro[5] advises that the role of community groups in negotiating aspects such as restriction of cars will not achieve maximum potential until they are viewed as companies instead of relying on outsiders: "*Community should be as strong as companies. We have been too much*

dependent on companies in our industrial societies. Japanese society is too much of kaisha [company] society."

In essence, positive elements of community in neighbourhoods include citizens' inclination to order and collective responsibility to attain societal harmony. Unfortunately, underlying differences such as between parents of small children versus households without children, car owners and carfree enthusiasts are avoided at the expense of liveliness of neighbourhood streets, and the enjoyment of streets as urban open spaces. As Sakada[3] notes, when activities are organized by someone outside the community, a leader must be present to solve any concerns raised by locals: *"For the sake of children, sometimes I have to pretend like there is no issue even if I know that the person hates the street activities."* However, as Funck (2007) reiterates, citizen movements are often a result of sudden changes in their places. This largely explains the current lacklustre attitude of citizens in agitating for change in Japan compared to the rise of citizen participation against pollution and subsequent health problems in the 1960s (Sorenson, 2002) that led to among other things, evening and weekend restrictions on cars to allow for playstreet in neighbourhoods.

7.3.5 Motivations for current activities

Although street activities cause conflict, people get comfortable if done consistently for many years as Misato[10], a senior citizen who has been a play leader for twenty years observes: "*there are happy people, while others think that it is annoying. But because we had Ninja training ten times, we got some understanding."* Therefore, facing the potential for conflicts, and being innovative has been a key driver for most leaders interviewed.

Generators of interest in street activities are diverse: they include request by peers, requests by local community leaders, and overseas experiences. Others had a gradual intellectual awakening while in urban-related specialties such as civil engineering and urban planning. Many people who played on streets as part of daily living space in their childhood have fond memories that they think people nowadays are missing. For Yumiko[12], though born in Shinagawa, she embraced carfree activities later in life for conservation of history after securing an office on a traditional street with weekly carfree hours. To Haruko[2], who also has an office along the same street, she sought to try some activities of her interest while at the same time assisting local leaders to reach the broader objectives.

Meanwhile, some play leaders and consultants who spearhead street activities or help community groups cannot recount experiences of organizing the same in the neighborhoods they live. For example, Taku[13] explains his non-participation as a consequence of living alone and not being rooted in his neighborhood. Most of the 'specialists', rarely experience the conflicts that arise among residents or with authorities; they also tend to be involved in special events compared to small activities. Although they do not represent the ideals of the local community, they assist local communities to develop street activities but they are not a representation of the ideals of the locals since they have no experience of the daily realities. Their activities according to Mura[8] they are meant to raise sensibility that people can do them independently in their neighborhoods. Due to limitations in funding, experts often assist shopping street associations as compared to ordinary residential streets that have limited financial capabilities. This kind of leadership has limitations in addressing people's needs.

7.3.6 Spin-off objectives and activities

Apart from the key organized activities such as street markets, festivals and street play, there are spin-off activities that often emerge on carfree streets. For example, after drawing on the streets using chalk, children learn how to clean up the street with water and brushes; the excitement equals the fulfilment they get from play while learning to be responsible members of society (Figure 4). Additionally, community fire fighters use such opportunities to educate children and adults on issues such as water connections on the streets; safety drills are also performed by local firemen during such occasions. In traditional areas such as Aisome, community leaders also use the opportunity to lead walking tours around the town.

In Kita-Shinagawa, the Ninja Training Journey and the Halloween parade are two street activities that are used to get children acquainted with their neighbourhood and to forge intergenerational communication. The street is also a platform to interact with foreigners who are more likely to join street activities compared to parks. Field notes in both Chuo-dori and Howdy mall also indicate enhanced freedom for movement by wheelchairs and the use of space by categories of people who may not be welcome in parks. There is also increased improvisation in utilizing streets such as sitting on bollards and curb. However, compared to children, adults rarely make new connections in street activities. The effects of carfree activities also tend to flow into neighbouring alleys.

7.4 Chapter Conclusion

From the outset of this study, we argued that blocking cars from neighbourhood streets is insufficient unless it is followed by stay activities undertaken by the local community.

The results confirm that carfree streets in neighbourhoods are complex spaces grounded on both tangible and subjective elements. They are tools for enhancing public wellbeing through safety from vehicular traffic, a platform for children's play and street markets. They are platforms for social bonds in community through the camaraderie that emerges between participants, sharing of tasks such as cleaning, allow for intergenerational communication, and offer a chance for children to interact with foreigners such as student volunteers. They are also spaces of conflict, places where the differences between "public" and "private" become ambiguous; differences emerge between approaches of local leaders and contracted specialists, proponents and opponents of stay activities, as well as between newcomers and those who have lived in the neighbourhood for long periods. All this is underlined by varying attitudes towards issues such as conflict, disturbances, mobility, and cleanliness. Traditional concepts about community as well as activities such as playing Ninja Play are however a good starting point when reintroducing community activities on neighbourhood streets.

The effect of elaborate events on daily life is still minimal while few community members are volunteering to undertake small-scale activities. Gradually, as Lefebvre (1991) notes, the rigidity of the state and the domination by automobiles has relegated local residents into mere consumers of the street space offered to them. At the same time, the affairs of the street environment as an open space is confined in the minds of a few citizens and visionary community leaders. As presented in figure 7.3, current challenges are a result of unjustified rationalism that is evident in people's disengagement from the affairs of their neighbourhood streets while negative attitudes, rigid administrative processes, and legalities discourage attempts to innovatively utilize street space in daily life. However,

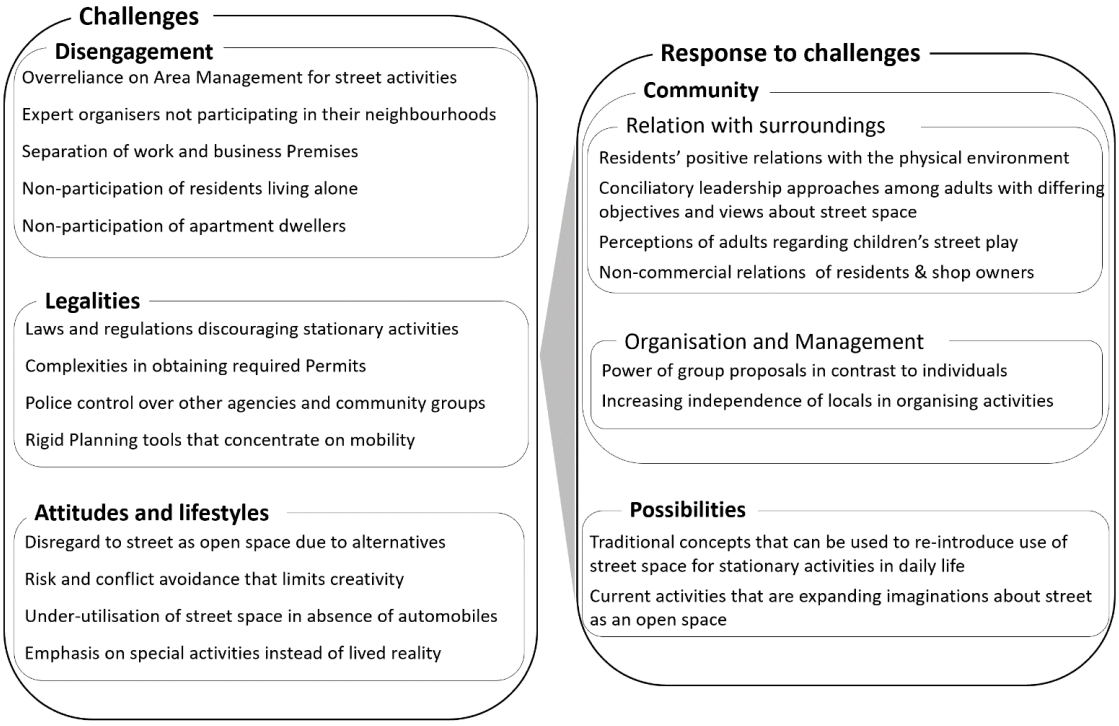

Figure 7. 3 Challenges in sustaining activities on car-free streets, and responses

community associations have been key in breaking the barriers between individual citizens and the established order of government agencies such as the police. Ultimately, to entrench a culture of using streets for stay activities in daily life, there is a need to demonstrate the wide array of possibilities on street space to awaken the imaginations of community members. Future studies involving other streets will be necessary in order to present an holistic view that can generate generalizable concepts.

Chapter 8: Quantitative Evaluation of Residents' Perceptions of Carfree Streets

8.0 Introduction

Previous chapters have presented the under-utilisation of carfree streets, the overreliance on special events, and the influence of alternatives such as parks in the continued neglect of streets as community open spaces. Consequently, this chapter attempts to quantify the extents to which local residents utilise neighbouring carfree streets for stay activities and their perceptions towards the activities (dependent variable) is examined against the independent variables (residents' perception of cars in neighbourhood streets, physical characteristics of the streets, the nature of activities, residents' involvement in neighbourhood associations, as well as residents' attributes such as age, household size and type of housing, and car ownership and usage) as shown in figure 8.0.1.

Figure 8.0. 1: A general articulation of the composite variables

8.1 Methodology

This chapter is based on a case study methodology involving three neighbourhoods. Based on participation in street activities as evaluated in previous chapters, four streets with organised activities such as playstreet were selected for a questionnaire survey. Two of the streets are within the 23 special wards of Tokyo, Aisome street in Bunkyo ward near Nezu Station and Tokkaido street in Shinagawa ward near Shimbamba station. Chuo-dori street is located in Mitaka City near Mitaka Station while Howdy Mall is in Chiba Prefecture near Kashiwa Station as shown in figure 8.1.1. The streets and their surroundings are shown in figures 8.1.2, 8.1.3, 8.1.4, and 8.1.5.

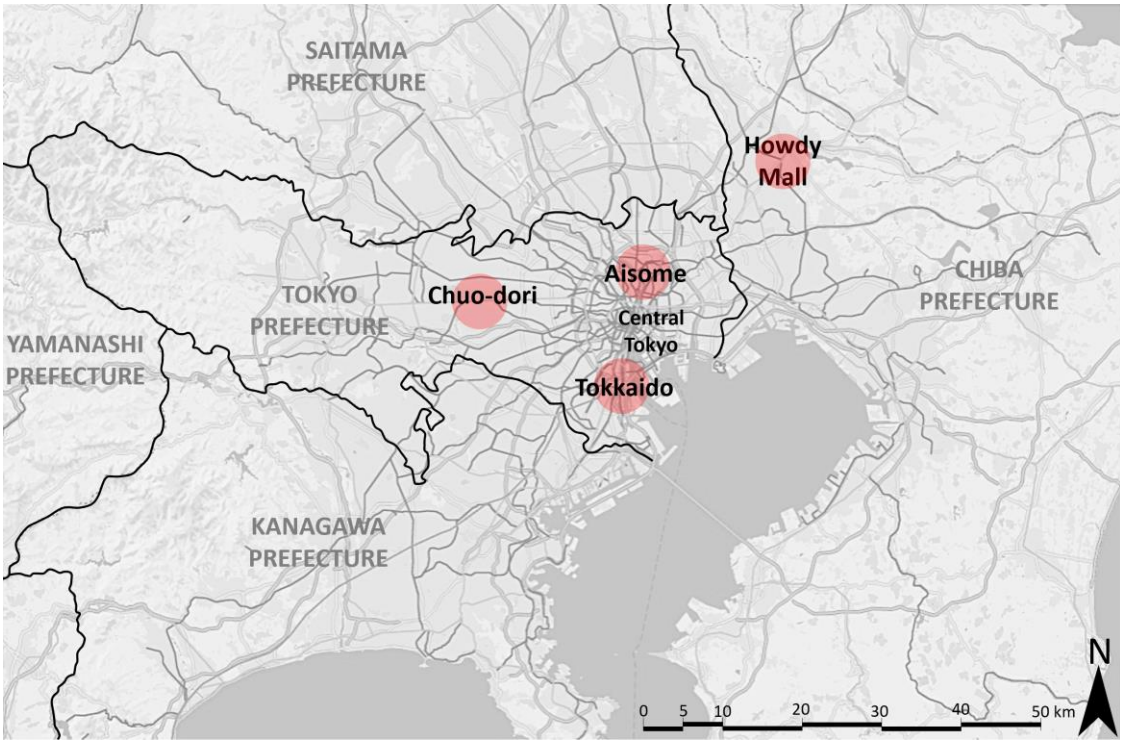

Figure 8.1. 1: Location of the 4 streets in the context of Tokyo Metropolitan

Figure 8.1. 2: Aisome-dori street and the surrounding neighbourhood
Source: Author

Figure 8.1. 3: Tokkaido street and the surrounding neighbourhood. Source: Author

Figure 8.1. 4: Chuo-dori street and the surrounding neighbourhood.
Source: Author

Figure 8.1. 5 Howdy-mall street and the surrounding neighbourhood.
Source: Author/Terada

A questionnaire survey was undertaken in residents around four streets. The questionnaires consisted of questions on respondent's attachment to the street, involvement in machizukuri, participation in carfree street activities, and car ownership and use. In addition, a five-point Likert scale with questions to measure perceptions towards the street environment regarding automobiles was included as shown in appendix 3. Attributes of respondents such as gender, age, and household size were also filled. A package of the questionnaire, an explanation sheet (Appendix 2), and a return envelope enclosed in a questionnaire were distributed through residents` through mail boxes.

The analysis began by descriptive statistics of the attributes or respondents' and their responses to various questions. Next, the significance of the differences in the results across the case studies was evaluated through a one-way ANOVA through the means and standard deviations. The significance of correlations of personal attributes such as gender, age, and years lived in the current location on various dependent variables was also evaluated. Factor analysis and Principle Component Analysis of a set of 17 questions on a Likert skill was done to reduce the factors into manageable components.

8.2 Results and Discussion

8.2.1 Attributes of respondents

This section discusses the results of responses from three neighbourhoods, a total of 235 returned questionnaires: Aisome (88), Tokkaido (80), and Chuo-dori (67). Howdy Mall was omitted because of the low number of responses (34). Among all responses, people in the 40s age-group are the biggest category (26%), followed by those in the 30s (16%) while respondents younger than 20 years form the smallest category (0.4%) as shown in

table 8.2.1. Regarding gender, 33.6 % of respondents were male and 66.4% were female (table 8.2.2).

Table 8.2. 1:Age of respondents

	<20	20s	30s	40s	50s	60s	≥70s
Aisome	-	14%	23.3%	19.8%	18.6%	10.5%	14%
Tokkaido	1.3%	11.5%	10.3%	37.2%	16.7%	10.3%	12.8%
Chuo-dori	-	12.3%	14%	19.3%	10.5%	24.6%	19.3%
Average	0.4%	13.9%	16%	26%	15.6%	13.4%	14.7%

Table 8.2. 2: Gender of respondents

	Male	Female
Aisome	31.4%	68.6%
Tokkaido	39%	61%
Chuo-dori	28.6%	71.4%
Average	33.6%	66.4%

From earlier interviews, people living in manshon (high rise apartments) and those living alone rarely join community groups; presence of children in households also has implications on participation in street activities. Among all respondents for this survey, 29.3% live alone, the largest category, followed closely by households of two members (24.3%), households of three members (22.5%), households of four members (16.2%), households of five members (6.8%), and one household of 7 members (0.9%) as shown in table 8.2.3. Majority of the households have no children of junior high school age and below (78.4%) as shown in table table 8.2.4.

Table 8.2. 3: Household size

	Living alone	2	3	4	5	6	7 People
Aisome	23.8%	22.6%	19%	22.6%	10.7%	-	1.2%
Tokkaido	27.4%	21.9%	32.9%	13.7%	4.1%	-	-
Chuo-dori	49%	29.1%	14.5%	10.9%	5.5%	-	-
Average	29.3%	24.3%	22.5%	16.2%	6.8%%	-	0.9%

Table 8.2. 4: Number of children (≤Junior high school and younger

	No children	1	2	3
Aisome	68.2%	13.6%	12.5%	5.7%
Tokkaido	80%	13.8%	3.8%	2.5%
Chuo-dori	94.7%	1.8%	3.5%	-
Average	78.4%	10.6%	7.5%	3.3%

Regarding housing, the biggest category of respondents lives in Manshon (high-rise apartments) 47.1%, followed by detached houses (31.4%), Apato (one or two stories` apartments), 20.2%, while dormitories and shared house comprise 1.3% (table 8.2.5). Most of the respondents have lived in their neighbourhoods for more than 10 years (53.5%) as shown in table table 8.2.6.

Table 8.2. 5: Housing type

	Apato (1-2 story apartments)	Manshon (≥3 stories apartments)	Detached House	Dormitory/ shared house
Aisome	24.7%	23.5%	49.4%	2.4%
Tokkaido	17.8%	57.5%	23.3%	1.4%
Chuo-dori	19.6%	41.1%	17.9%	-
Average	20.2%	47.1%	31.4%	1.3%

Table 8.2. 6: Years lived in this neighbourhood

	<1 year	1-2 years	2-5yrs	5-10yrs	≥10years
Aisome	10.8%	9.6%	16.9%	12%	50.6%
Tokkaido	9.1%	3.9%	15.6%	18.2%	53.2%
Chuo-dori	7.1%	10.7%	8.9%	14.3%	58.9%
Average	10.6%	7.9%	14.6%	13.4%	53.5%

Regarding occupations, the biggest proportion of respondents are company employees (37.3%) as shown in table 8.2.7. Only 27.5% of respondents own cars (table 8.2.8); the biggest proportion of the car owners use the car many times a month (45.8%) and only15.3% use the car daily (table 8.2.9).

Table 8.2. 7: Occupation

	Self-employed	Company employee	Part-time Job	Student	Housewife	Jobless
Aisome	19%	35.7%	10.7%	6%	19%	9.5%
Tokkaido	23.1%	33.3%	15.4%	7.7%	10.3%	10.3%
Chuo-dori	19.6%	41.1%	17.9%	-	7.1%	14.3%
Average	21.1%	37.3%	13.6%	5.3%	12.3%	10.5%

Table 8.2. 8: Car Ownership

	Car owners
Aisome	25.6%
Tokkaido	35.4%
Chuo-dori	23.6%
Average	27.5%

Table 8.2. 9: Frequency of using the car

	Once a year	Many times a year	Once a month	Many times a month	Many times a week	Daily
Aisome	-	-	5%	45%	40%	10%
Tokkaido	7.7%	-	7.7%	42.3%	19.2%	23.1%
Chuo-dori	-	15.4%	7.7%	53.8%	15.4%	7.7%
Average	3.4%	3.4%.3%	6.8%%	45.8%	25.4%	15.3%

8.2.2 Involvement in street activities

In general, residents use of streets for stay activities is common during festivals. A smaller proportion of residents have been involved in selling items as compared to involvement in buying during street markets. The proportion of residents who have been involved in festivals is more pronounced in Tokkaido compared to other streets. A relatively greater proportion of residents has been involved in selling street items in Chuo-dori compared to other streets.

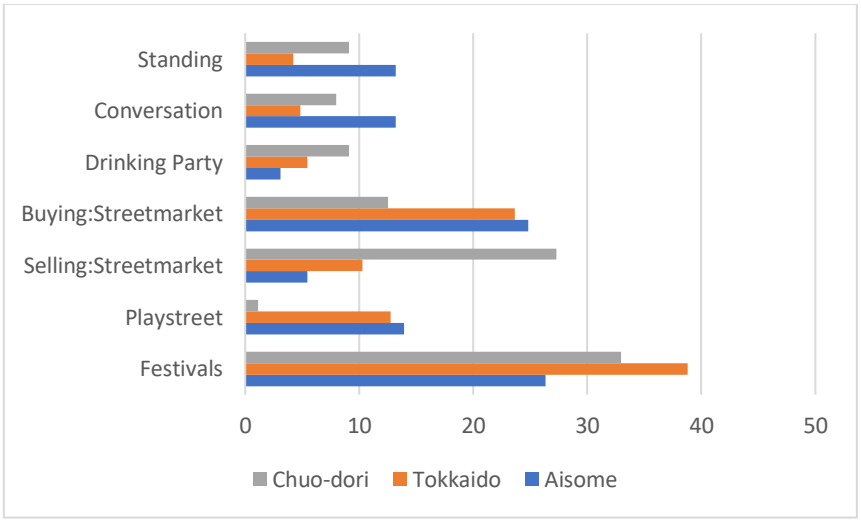

Figure 8.2. 1: involvement in street activities

When the significance ($p \leq 0.05$) of differences across the three case studies are investigated (table 8.2.10), the variances are not significant for Standing ($F=1.839$, $p=0.162$), Conversations on the street ($F=1.226$, $p=0.296$), Buying items during street

markets (F=0.322, p=0.322). The differences across the three case studies were however significant for Drinking Party (F=5.184, p=0.0006), Selling items during street markets (F=5.329, p=0.006), Playstreet (F=7.1267, p=001), and Festivals (F=13.975, p=.000).

Table 8.2. 10: One Way ANOVA analysis of street activities for 3 streets

		N	Mean	Std. Dev	df	F	p
Standing	Aisome dori	79	.2152	.41358	2-208	1.839	.162
	Tokkaido	76	.1053	.30893			
	Chuo dori	56	.1964	.40089			
Conversation	Aisome dori	79	.1899	.39471	2-208	1.226	.296
	Tokkaido	76	.1053	.30893			
	Chuo dori	56	.1250	.33371			
Drinking party	Aisome dori	79	.0506	.22065	2-208	5.184	.0006**
	Tokkaido	76	.1184	.32525			
	Chuo dori	56	.2321	.42602			
Streetmarket-Buying	Aisome dori	79	.3924	.49141	2-208	1.139	.322
	Tokkaido	76	.5132	.50315			
	Chuo dori	56	.4464	.50162			
Streetmarket-Selling	Aisome dori	79	.1139	.31975	2-208	5.329	.00 6**
	Tokkaido	76	.2237	.41948			
	Chuo dori	56	.0357	.18726			
Playstreet	Aisome dori	79	.3165	.46806	2-208	7.126	.001**
	Tokkaido	76	.2368	.42797			
	Chuo dori	56	.0536	.22721			
Festivals	Aisome dori	79	.4304	.49829	2-208	13.975	.000**
	Tokkaido	76	.8158	.39023			
	Chuo dori	56	.6607	.47775			

8.2.3 Conversations on the street

The biggest proportion of respondents have social interactions with fellow residents "many times a week" followed by "many times a month." Engagement in daily conversations on the street is highest in Tokkaido and lowest in Chuo-dori as shown in figure 8.2.2. A big proportion of residents never meet any acquaintances in day-to-day life. Only three of the differences across the three cases were statistically significant p ≤0.05 as shown in table 8.2.11: once a year (F=4.639, p=0.011), many times a week (F=3.199, p=0.043), and every day (F=4.890, p=0.008). Other differences were not

statistically significant: many times a year (F=1.909, p=0.151), once a month (F=1.481, p=0.229), and many times a month (F=0.328, p=0.721).

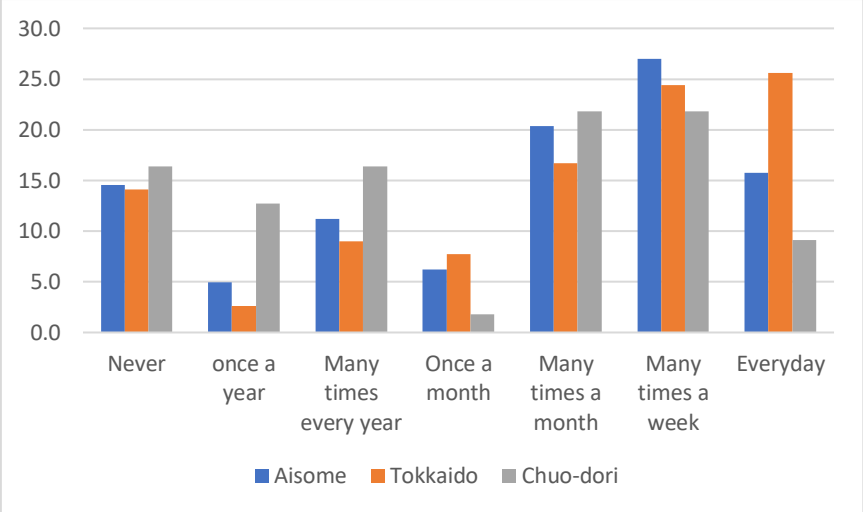

Figure 8.2. 2: Conversations on the street

Table 8.2. 11: One-way ANOVA analysis of variance for frequency of meeting acquaintances

		N	Mean	Std. Dev	df	F	p
Never	Aisome dori	88	.0682	.25350	2-232	2.290	.104
	Tokkaido	80	.1375	.34655			
	Chuo dori	67	.1791	.38633			
Once a year	Aisome dori	88	.0227	.14989	2-232	4.639	.011*
	Tokkaido	80	.0250	.15711			
	Chuo dori	67	.1194	.32671			
Many times a year	Aisome dori	88	.0909	.28913	2-232	1.909	.151
	Tokkaido	80	.0875	.28435			
	Chuo dori	67	.1791	.38633			
Once a month	Aisome dori	88	.0682	.25350	2-232	1.481	.229
	Tokkaido	80	.0750	.26505			
	Chuo dori	67	.0149	.12217			
Many times a month	Aisome dori	88	.2045	.40568	2-232	.328	.721
	Tokkaido	80	.1625	.37124			
	Chuo dori	67	.2090	.40963			
Many times a week	Aisome dori	88	.3523	.48042	2-232	3.199	.043*
	Tokkaido	80	.2375	.42824			
	Chuo dori	67	.1791	.38633			
Everyday	Aisome dori	88	.1250	.33261	2-232	4.890	.008*
	Tokkaido	80	.2500	.43574			
	Chuo dori	67	.0746	.26477			

Results of correlation analysis of residents' conversations on the street against their personal attributes done through crosstabulation found that none of the attributes of respondents was statistically significant ($p \leq 0.05$) as shown in table 8.2.12.

Table 8.2. 12: Correlation of on-street conversations against attributes of respondents

	Age	Gender	Household Size	Children in household	House-type	Occupation	Years lived in current location	Car ownership
Pearson Chi-square	3.682	.228[a]	.060	1.003	3.827	2.217	.747	.174
p value	.159	.633	.807	.317	.148	.137	.688	.676
Cramer`s V	.133	.033	.017	.069	.139	.104	.060	.029

8.2.4 Participation in community organisations (chokai/shotengai)

Most respondents do not participate in the affairs of neighbourhood associations. Participation is highest in Tokkaido (58.2%), followed by Aisome (46.7%), and lowest in Chuo-dori (30.8%) as shown in figure 8.2.3.

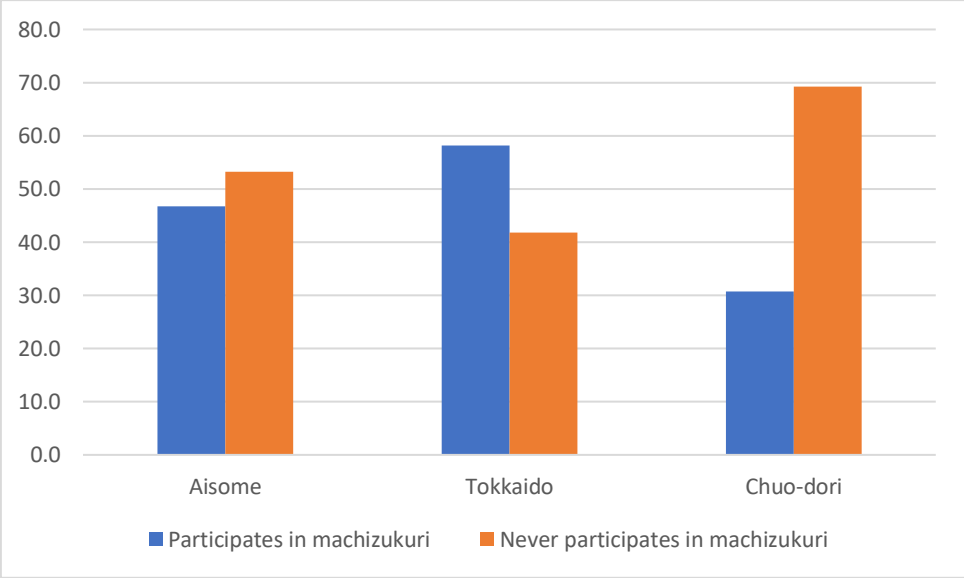

Figure 8.2. 3: participation in community activities

The One-way Anova test of variance for the three streets showed a statistically significant (p= 0.003) variance (F=6.003, df =2-224) as shown in table 8.2.13. Results of Chi-square tests relating participation against attributes of respondents showed that two attributes were not statistically significant influences on participation in local associations (p

≤0.05): Gender (p=0.051) and occupation (p=0.299) as shown in table 8.2.14. The others were significantly related but with weak correlations (Cramers V).

Table 8.2. 13: One-way Anova analysis of participation in street neighbourhood associations

	N	Mean	Std. Dev	df	F	p
Aisome dori	87	1.52	.503	2-224	6.003	.003
Tokkaido	79	1.42	.496			
Chuo dori	61	1.70	.460			

Table 8.2. 14: Correlation of involvement in neighbourhood associations against residents` attributes

	Age	Gender	Household Size	Children in household	House type	Occupation	Years lived in current location	Car ownerships
Pearson Chi-square	8.773	3.797	17.808	12.665	13.799	1.079	22.486	9.423[a]
p value	.012	.051	.000	.000	.001	.299	.000	.002
Cramer`s V	.198	.131	.288	.236	.255	.070	.321	.205

8.2.4.1 Kinds of community involvement

Most people who are involved in machizukuri are mere participants and few take up special roles. However, the number of respondents who have been leaders in activities is slightly higher in Tokkaido (13.0%) compared to Chuo-dori (11.1%) and Aisome (8.5%). Only the difference in the number of participants was significant across the three cases (table 8.2.15). The number of responses were insufficient for a proper chi-square test for the influence of residents' attributes.

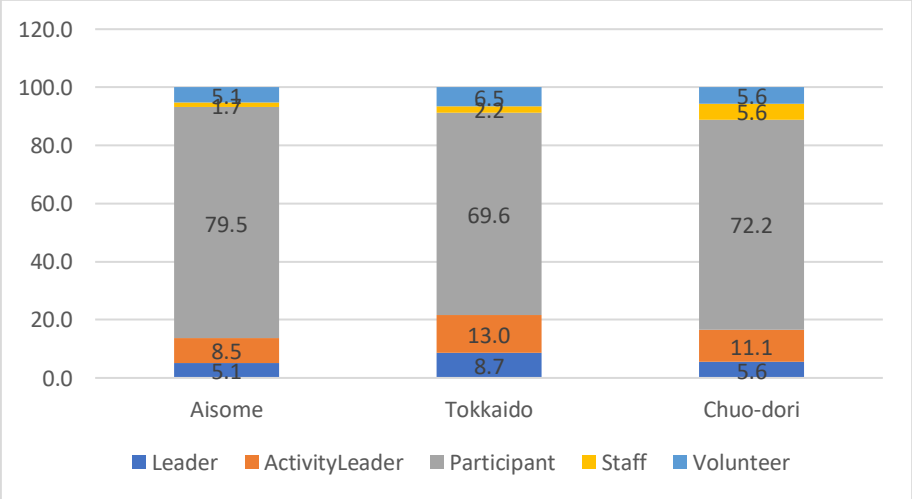

Figure 8.2. 4: kind of involvement in community activities

Table 8.2. 15: One-way Anova analysis of type of participation in neighbourhood associations

		N	Mean	Std. Dev	df	F	p
Leader	Aisome dori	88	.0000	.00000	2-232	2.631	.074
	Tokkaido	80	.0500	.21932			
	Chuo dori	67	.0149	.12217			
Activity leader	Aisome dori	88	.0227	.14989	2-232	1.592	.206
	Tokkaido	80	.0750	.26505			
	Chuo dori	67	.0299	.17146			
Participant	Aisome dori	88	.4318	.49817	2-232	4.717	.010
	Tokkaido	80	.4000	.49299			
	Chuo dori	67	.2090	.40963			
Staff	Aisome dori	88	.0000	.00000	2-232	-	
	Tokkaido	80	.0000	.00000			
	Chuo dori	67	.0000	.00000			
Volunteer	Aisome dori	88	.0000	.00000	2-232	.612	.543
	Tokkaido	80	.0125	.11180			
	Chuo dori	67	.0149	.12217			

8.2.5 Willingness to participate in carfree activities

There is an almost equal proportion of people willing and those who are unwilling to participate in carfree street activities. However, for Chuo-dori which has fewer activities per year, only a small proportion is willing (22.2%) compared to 42.2% in Aisome and 51.3% in Tokkaido. The variance across the three cases is statistically significant (F=6.488, p=0.002) as shown in table 5.8.16. There are no significant variances for specific activities except for street markets (F=8.127, p=0.000) as shown in table 5.8.17. However, five attributes are statistically significant ($p \leq 0.05$) influences on people's willingness to participate in future activities: age (p=0.042), gender (p=0.000), household size (p=0.025), presence of children in the household (p=0.000), and occupation (p=0.030) as shown in table 5.8.18.

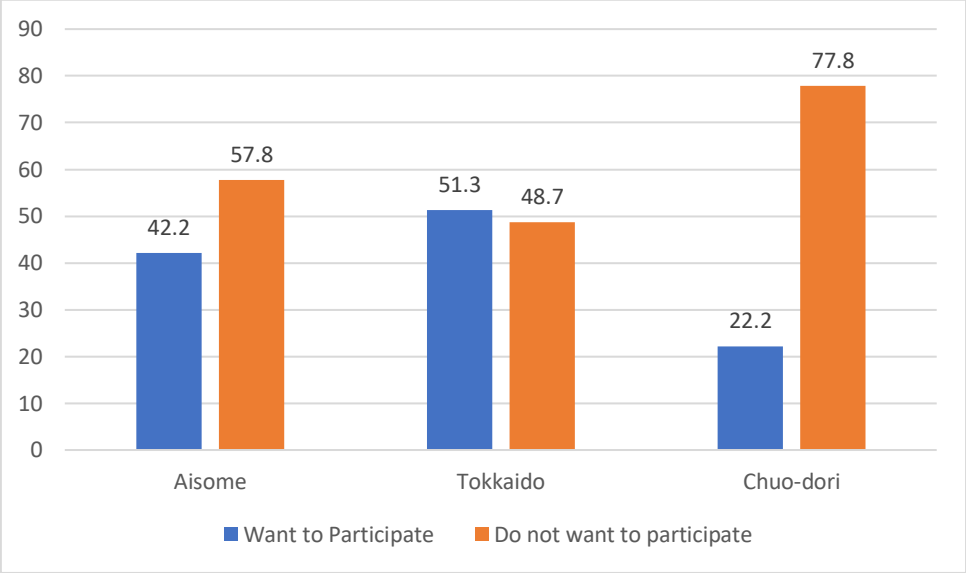

Figure 8.2. 5: willingness to participate in future activities

Table 8.2. 16: One-way ANOVA analysis of willingness to participate across three streets

	N	Mean	Std. Dev	df	F	p
Aisome dori	79	1.5063	.50315	2-214	6.488	0.002
Tokkaido	76	1.4868	.50315			
Chuo dori	62	1.7581	.43175			

Table 8.2. 17: One-way ANOVA analysis of willingness to participate across three streets

		N	Mean	Std. Dev	df	F	p
Festival	Aisome dori	88	.1705	.37819	2-232	2.083	.127
	Tokkaido	80	.2125	.41166			
	Chuo dori	67	.0896	.28769			
Street market	Aisome dori	88	.1364	.34514	2-232	8.127	.000
	Tokkaido	80	.0000	.00000			
	Chuo dori	67	.0299	.17146			
Bar or Food stand	Aisome dori	88	.0227	.14989	2-232	.775	.462
	Tokkaido	80	.0125	.11180			
	Chuo dori	67	.0000	.00000			
Play	Aisome dori	88	.0568	.23282	2-232	2.917	.056
	Tokkaido	80	.0125	.11180			
	Chuo dori	67	.0000	.00000			
Other events	Aisome dori	88	.0568	.23282	2-232	1.087	.339
	Tokkaido	80	.0875	.28435			
	Chuo dori	67	.0299	.17146			

Table 8.2. 18: Correlation of involvement in neighbourhood associations against residents` attributes

	Age	Gender	Household Size	Children in household	House type	Occupation	Years lived in current location	Car ownership
Pearson Chi-square	6.328	14.298	5.041	19.617	3.383	4.713	2.281	.907
p value	.042	.000	.025	.000	.184	.030	.320	.341
Cramer`s V	.172	.260	.157	.301	.129	.149	.104	.065

8.2.6 Willingness to organise Street activities

Few people are interested in organising street activities except in Aisome where the proportion of those who want and those who do not want to organise is almost the same (figure 8.2.6). The proportion is lowest in Chuo-dori (19.6%). The variance across the three cases was not statistically significant (F=2.098, p=0.126) as shown in table 8.2.19. The number of responses were insufficient for a proper chi-square test for the influence of residents' attributes.

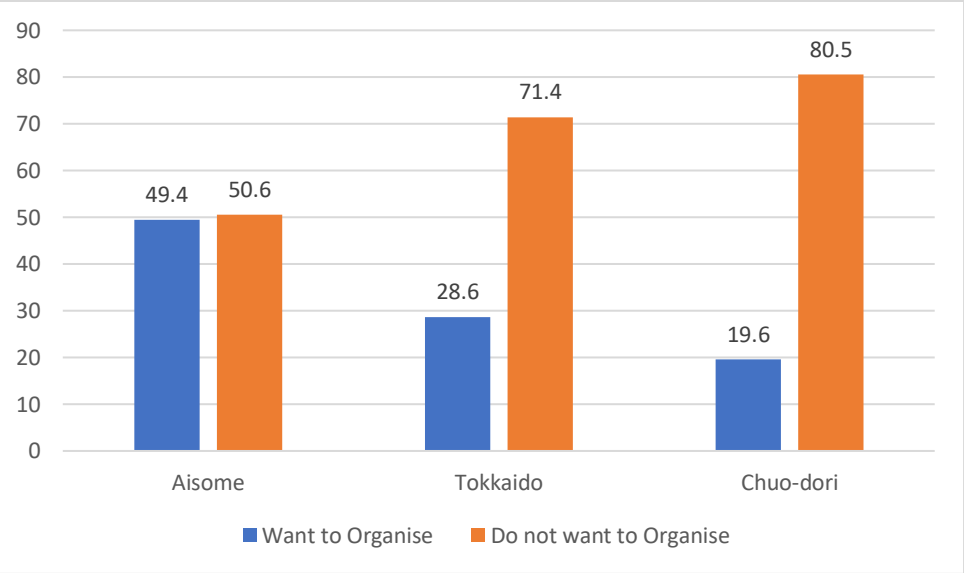

Figure 8.2. 6: willingness to organise activities

Table 8.2. 19: One-way ANOVA of willingness to participate in future activities

	N	Mean	Std. Deviation	df	F	p
Aisome dori	66	1.8485	.36130	2-187	2.098	.126
Tokkaido	70	1.7143	.45502			
Chuo dori	54	1.8333	.42337			

8.2.7 Perceptions regarding streets and automobiles

In this section, residents were required to state their level of agreement or disagreement with 17 propositions based on a Likert scale of five levels (1Totally disagree----2Disagree----3Neutral----4Agree----5Totally agree). Propositions derived from literature review and findings in previous chapters of this thesis were used. Propositions fall into four major categories:

Category 1: Propositions about experiences during carfree street activities

- 1: The street is an open space for community activities
- 2: I like participating in street activities
- 10: During street events, the street is like a park
- 14: There is no need for street activities on this street
- 6: Activities on the street can cause inconveniences
- 7: I feel relaxed when I come to this street

Category 2: Propositions about the significance of cars on the neighbourhood street

- 3: Cars are a threat to this neighbourhood
- 8: It is important for cars to pass through this street
- 12: Cars should not be allowed at certain times
- 13: Carfree street events are inconvenient to car owners
- 15: The street is not an open space but for cars
- 17: Cars should be permanently restricted on this street

Category 3: Propositions about safety in the neighbourhood street

- 5: Children can play even if there is a possibility of cars passing
- 9: There is stranger danger for children on this street

- 11: Children can play during carfree hours
- 16: The street is not a safe place

Category 4: Propositions about the process of organising street activities

- 4: I understand the process of seeking permission for carfree street activities

The propositions were randomised to maximise the independence in responses to each question. The question read: “please state your agreement or disagreement with the following statements,” and a table with questions and five levels (Totally disagree----Disagree----Neutral----Agree----Totally agree) were included. The results for each proposition are shown in later sub-sections in this chapter.

To explore the factorial structure of resident’s perception of carfree streets, Exploratory Factor Analysis of the 17 propositions was undertaken in SPSS. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy showed the adequacy of the sample through a high KMO= 0.78. A Bartlett's Test of Sphericity 780.052 with a significance $p<.001$ showed that the correlation structure was sufficient for factor analysis. The maximum likelihood factor analysis with a cut-off point of .30 and the Kaiser’s criterion of eigenvalues greater than 1 resulted in four components as accounting for 51.73% of the variance.

Component 1 generally consists of variables explaining the character and enjoyment of street activities, component 2 generally consists of variables explaining the importance of cars in the neighbourhoods. Component 3 generally consists of variables regarding inconveniences and dangers of cars in neighbourhood streets, while Component 4 consists of variables about the process of organising street activities and the possibility of playstreet when cars pass the on-neighbourhood streets. The contribution of each

component is tabulated in table 8.2.20. In cases where a factor loaded in more than one component, the stronger value was considered. The items as they appear in the rotated component matrix are shown in table 8.2.21.

Table 8.2. 20: Percentage of variance explained by each component

Component 1 Character & enjoyment of street activities	**Component 2** Importance of cars	**Component 3** Inconveniences & dangers of cars	**Component 4** Processes and dangers in street activities
23.3%	12.2%	9.2%	7%

Table 8.2. 21: rotated component matrix

	Component			
	1	2	3	4
14 There is no need for street activities on this street	-.747		.360	
10 During street events, the street is like a park	.700			
2 I like participating in street activities	.696			
1 The street is an open space for community activities	.662			
11 Children can play during carfree hours	.590			
7 I feel relaxed when I come to this street	.584			
15 The street is not an open space but for cars	-.497	-.414	.363	
12 Cars should not be allowed at certain times	.318	.680		
17 Cars should be permanently restricted on this street		.678		
3 Cars are a threat to this neighbourhood		.663		
8 It is important for cars to pass through this street		-.627		
13 Carfree street events are inconvenient to car owners			.688	
6 Activities on the street can cause inconveniences			.669	-.309
9There is stranger danger for children on this street			.635	
16 the street is not a safe place			.515	
4 I understand the process of seeking permission for carfree street activities				.668
5 Children can play even if there is a possibility of cars passing				.608

Note: Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]

The relationship between components is tabulated in table 8.2.22 below.

Table 8.2. 22: Component transformation matrix

	1	**2**	**3**	**4**
1	.832	.202	-.440	.270
2	-.310	.936	-.063	.152

3	.348	.131	.887	.274
4	-.300	-.255	-.126	.910

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

8.2.8 Correlation of variables in component 1 against residents' attributes

Results of correlating residents' attributes such as age, gender were correlated against seven variables in Component 1 (table 8.2.23) revealed that the propositions "There is no need for street activities on this street," "During street events, the street is like a park," "The street is an open space for community activities," and "Children can play during carfree hours" were not significantly correlated to any attributes of residents. Due to expected values below 5 in many instances, some columns in attributes were collapsed to increase the values per cell.

Table 8.2. 23 Correlation of variables in Component 1 against residents` attributes

		Age	Gender	Household Size	Children	House type	Occupation	Length of stay	Car ownership
14.There is no need for street activities on this street	Pear Cor	.028	-.083	-.043	-.096	-.054	.065	.010	-.058
	Sig.	.673	.210	.528	.143	.426	.332	.882	.382
10.During street events, the street is like a park	Pear Cor	-.079	.048	.114	.124	.027	-.048	.041	.101
	Sig.	.232	.471	.092	.058	.696	.471	.539	.128
2.I like participating in street activities	Pear Cor	-.081	.183**	.131	.217**	.126	.026	.048	.012
	Sig.	.223	.005	.052	.001	.063	.699	.475	.856
1.The street is an open space for community activities	Pear Cor	.030	.000	-.007	.041	.072	.062	.007	.049
	Sig.	.652	1.000	.917	.530	.286	.353	.919	.462
11.Children can play during carfree hours	Pear Cor	.241	.064	-.008	.019	.072	-.092	-.067	-.026
	Sig.	229	.340	.908	.778	.291	.168	.319	.697
7.I feel relaxed when I come to this street	Pear Cor	-.185**	.072	-.096	-.019	-.061	-.119	-.023	.010
	Sig.	.005	.276	.155	.773	.367	.073	.736	.886
15.The street is not an open space but for cars	Pear Cor	.054	.007	-.014	-.055	.004	.225**	.585**	-.231**
	Sig.	.417	.911	.832	.408	.949	.001	.000	.000

Since the proposition "I like participating in street activities" was significantly influenced by two attributes, "gender" and "households with children" it was prudent to run a regression model to find out the relation of this proposition as a dependent variable

against the other six in propositions in Component 1. The results (table 8.2.24) showed that four of these propositions statistically significantly predict "I like participating in street activities" F (6-219)=29.417, p=0.000, R^2=0.446. These statically significant propositions are: "There is no need for street activities on this street ($p < 0.001$)," During street events, the street is like a park($p < 0.001$)," "The street is an open space for community activities ($p < 0.001$)," and "I feel relaxed when I come to this street (p=0.032)."

Table 8.2. 24: Correlation of I like participating in street activities against other variables in Component 1

	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	2.084	.425		4.908	.000	1.247	2.921
14.There is no need for street activities on this street	-.268	.070	-.266	-3.840	.000	-.405	-.130
10.During street events, the street is like a park	.241	.052	.274	4.640	.000	.139	.344
1.The street is an open space for community activities	.275	.064	.251	4.311	.000	.149	.401
11.Children can play during carfree hours	-.068	.059	-.065	-1.151	.251	-.184	.048
7.I feel relaxed when I come to this street	.123	.057	.118	2.154	.032	.010	.235
15.The street is not an open space but for cars	-.045	.056	-.049	-.807	.421	-.155	.065

8.2.8.1 There is no need for street activities on this street (14)

In particular, many residents see the need for street activities in Chuo-dori (mean 2.18) followed by Aisome (mean 2.26) and Tokkaido (mean 2.29) as shown in figure 8.2.7. However, differences across the three streets were not statistically significant (table 8.2.25).

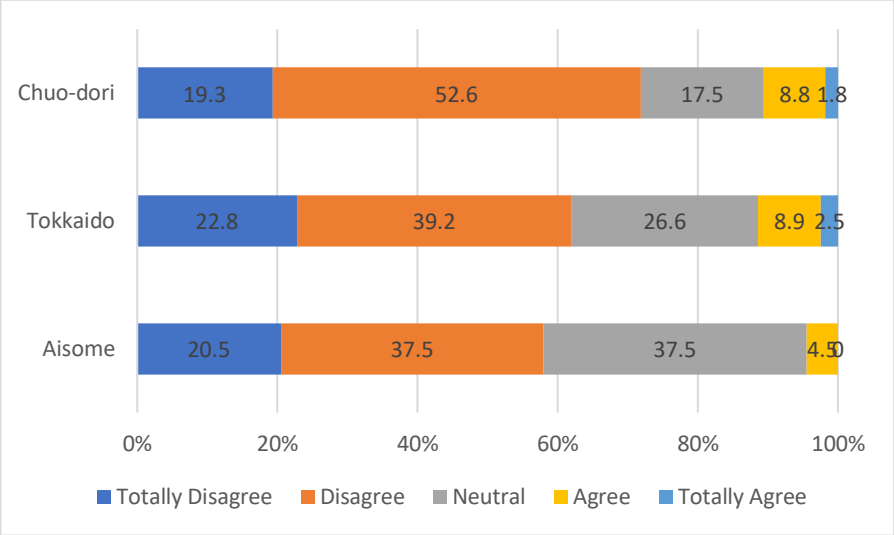

Figure 8.2. 7: There is no need for street activities on this street

Table 8.2. 25: One-way Anova analysis of "there is no need for street activities on this street."

	N	Mean	Std. Dev	df	F	p
Aisome dori	88	2.26	.837	2-231	.294	.746
Tokkaido	79	2.29	1.002			
Chuo dori	67	2.18	.869			

8.2.8.2 During street events, the street is like a park (10)

There is a general agreement of the transformation of the street into an open space during street activities. It is however higher in Tokkaido compared to Aisome and Chuo-dori (figure 8.2.8).

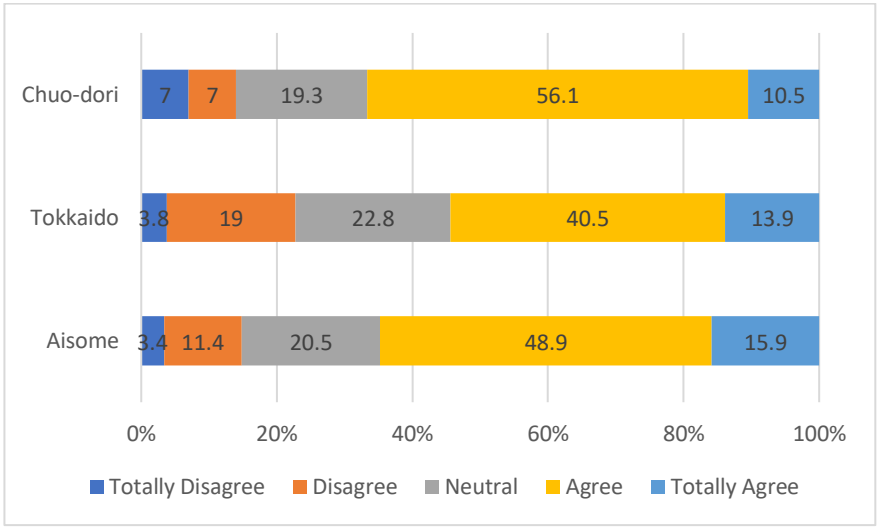

Figure 8.2. 8: During street events, the street is like a park

However, differences across the three streets were not statistically significant (table 8.2.26).

Table 8.2. 26: One-way Anova analysis of "During street events, the street is like a park."

	N	Mean	Std. Dev	df	F	p
Aisome dori	88	3.63	.998	2-231	1.093	.337
Tokkaido	79	3.42	1.069			
Chuo dori	67	3.63	.982			

8.2.8.3 I like participating in street activities (2)

A bigger proportion of residents have a neutral feeling regarding whether they like or dislike participating in carfree street activities. However, residents around Tokkaido and Aisome where activities are often held are more positive (figure 2.8.9). The differences across the three streets were not statistically significant (table 8.2.27).

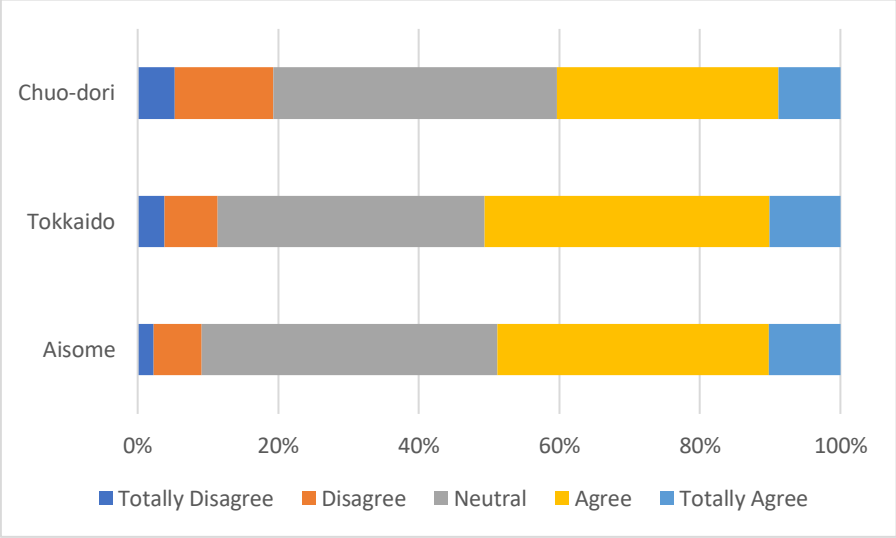

Figure 8.2. 9: I like participating in street activities

Table 8.2. 27: One-way Anova analysis of "I like participating in street activities."

	N	Mean	Std. Dev	df	F	p
Aisome dori	88	3.48	.857	2-231	1.164	.314
Tokkaido	79	3.46	.917			
Chuo dori	67	3.27	.947			

8.2.8.4 The street is an open space for community activities (1)

In general, there is an agreement that streets are open spaces for community activities. however, this is highest in chou-dori (mean 3.72). The differences across the three streets were not statistically significant (table 8.2.28).

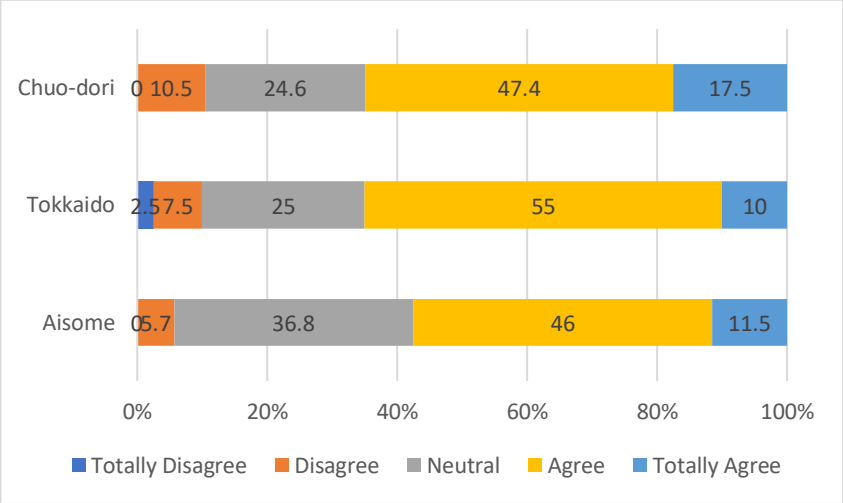

Figure 8.2. 10: The street is an open space for community activities

Table 8.2. 28: One-way Anova analysis of "The street is an open space for community activities"

	N	Mean	Std. Dev	df	F	p
Aisome dori	87	3.63	.764	2-231	.188	.829
Tokkaido	80	3.63	.862			
Chuo dori	67	3.70	.853			

8.2.8.5 Children can play during carfree hours (11)

There is greater agreement that children can play during carfree hours in Aisome compared to the other streets (figure 8.2.11). The differences across the three streets were statistically significant, $p < 0.001$as shown in table 8.2.29.

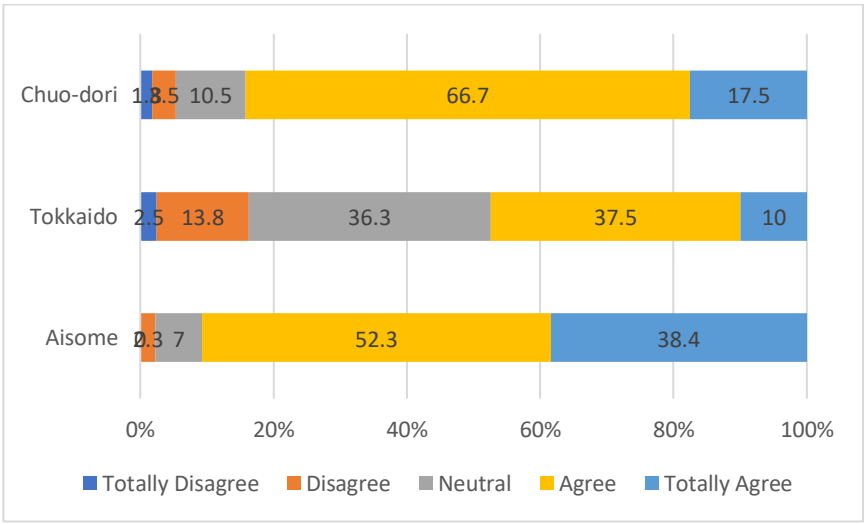

Figure 8.2. 11: Children can play during carfree hours

Table 8.2. 29: One-way Anova analysis of "Children can play during carfree hours."

	N	Mean	Std. Dev	df	F	p
Aisome dori	86	4.27	.693	2-230	25.979	.000
Tokkaido	80	3.39	.934			
Chuo dori	67	3.96	.727			

8.2.8.6 I feel relaxed when I come to this street (7)

There is greater agreement on the relaxing effect of Aisome and Tokkaido compared to Chuo-dori (figure 8.2.12). The differences across the three streets were not statistically significant (table 8.2.30).

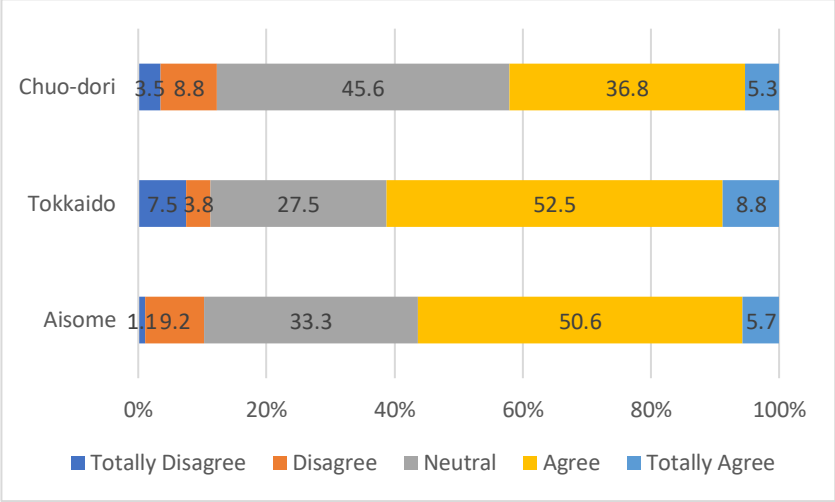

Figure 8.2. 12: I feel relaxed when I come to this street

Table 8.2. 30 One-way Anova analysis of "I feel relaxed when I come to this street."

	N	Mean	Std. Dev	df	F	p
Aisome dori	87	3.51	.791	2-231	.726	.485
Tokkaido	80	3.51	.981			
Chuo dori	67	3.36	.811			

8.2.8.7 The street is not an open space but for cars (15)

Many residents seem to understand that the street is not primarily for cars. This is highest in Tokkaido (mean 2.34) followed by Aisome (mean 2.2) and Chuo-dori (mean 2.06) as shown in table 8.2.13. Differences across the three streets are not statistically significant (table 8.2.31)

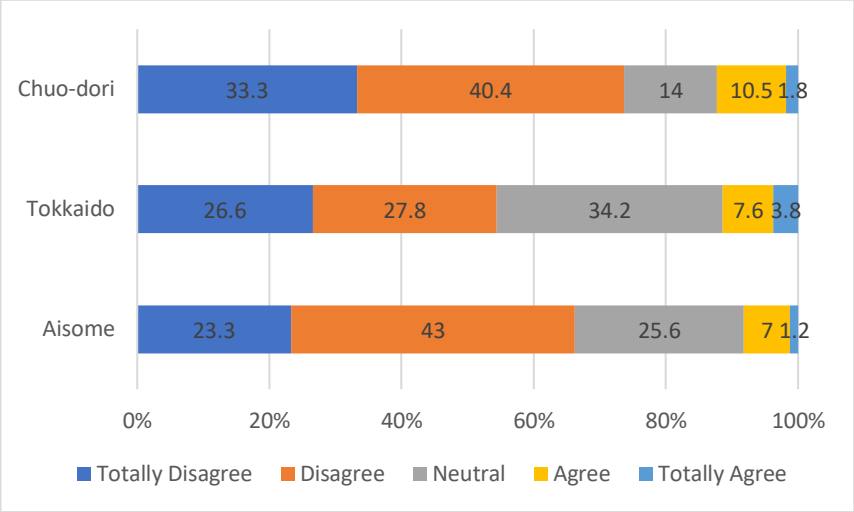

Figure 8.2. 13: The street is not an open space but for cars

Table 8.2. 31: One-way Anova analysis of "The street is not an open space but for cars."

	N	Mean	Std. Dev	df	F	p
Aisome dori	86	2.20	.918	2-229	1.460	.234
Tokkaido	79	2.34	1.073			
Chuo dori	67	2.06	.998			

8.2.9 Correlation of variables in component 2 against residents' attributes

Results of correlating residents' attributes such as age, gender were correlated against seven variables in Component 2 (table 8.2.32) revealed that the proposition "cars should not be allowed at certain times" did not have any statistical significance to any residents' attributes. The results showed that two of these propositions statistically significantly predict "I like participating in street activities" F (4-222)=4.741, p=0.001, R^2=0.079 "Cars should not be allowed at certain times ($p < 0.001$)" and "Cars should be permanently restricted on this street (p=0.011)" as shown in table 8.2.33.

Table 8.2. 32 Correlation of variables in Component 2 against residents` attributes

		Age	Gender	Household Size	Children	House type	Occupation	Length of stay	Car ownership
12.Cars should not be allowed at certain times	Pear Cor	.033	.017	-.049	-.036	.004	-.003	.011	.092
	Sig.	.617	.800	.474	.582	.953	.967	.872	.168
17.Cars should be permanently restricted on this street	Pear Cor	.228**	.001	-.030	-.104	.080	.072	.089	.065
	Sig.	.000	.985	.654	.113	.237	.280	.183	.324
3.Cars are a threat to this neighbourhood	Pear Cor	.076	-.065	-.054	.053	.026	.025	.044	.159*
	Sig.	.255	.331	.429	.423	.708	.705	.514	.017
8.It is important for cars to pass through this street	Pear Cor	.003	-.010	.089	-.036	.038	-.169*	.051	-.204**
	Sig.	.968	.883	.188	.585	.579	.011	.447	.002

Table 8.2. 33: Correlation of I like participating in street activities against other variables in Component 2

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	2.762	.393		7.032	.000	1.988	3.536
12.Cars should not be allowed at certain times	.235	.063	.261	3.710	.000	.110	.359
17.Cars should be permanently restricted on this street	-.170	.067	-.189	-2.550	.011	-.301	-.039
3.Cars are a threat to this neighbourhood	.061	.068	.063	.890	.374	-.074	.195
8.It is important for cars to pass through this street	.018	.073	.017	.247	.805	-.126	.162

8.2.9.1 Cars should not be allowed at certain times (12)

There is a general support for temporary carfree streets (figure 8.2.14) but the differences across the streets are not statistically significant (table 8.2.34)

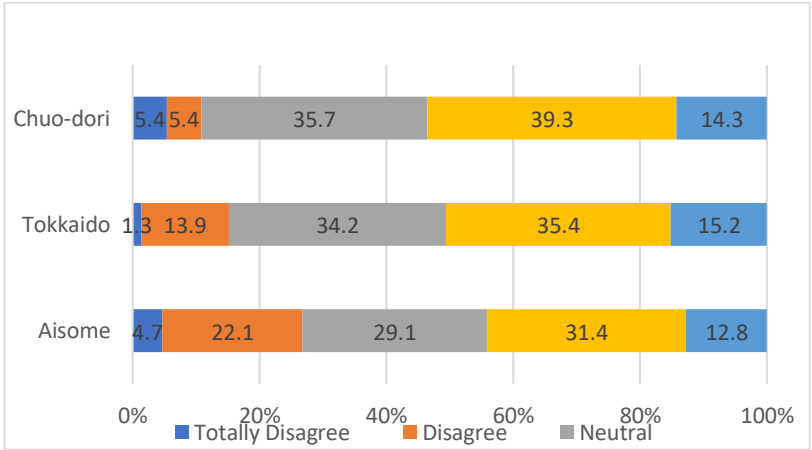

Figure 8.2. 14: Cars should not be allowed at certain times

Table 8.2. 34: One-way Anova analysis of "Cars should not be allowed at certain times."

	N	Mean	Std. Dev	df	F	p
Aisome dori	86	3.26	1.087	2-228	1.309	.272
Tokkaido	79	3.49	.959			
Chuo dori	66	3.45	.964			

8.2.9.2 Cars should be permanently restricted on this street (17)

There is a general disagreement towards permanent car restrictions especially in Aisome (Mean 2.02) followed by Tokkaido (2.35) and Chuo-dori (mean 2.46) as shown in figure 8.2.15. However, but the differences across the streets are not statistically significant (table 8.2.35)

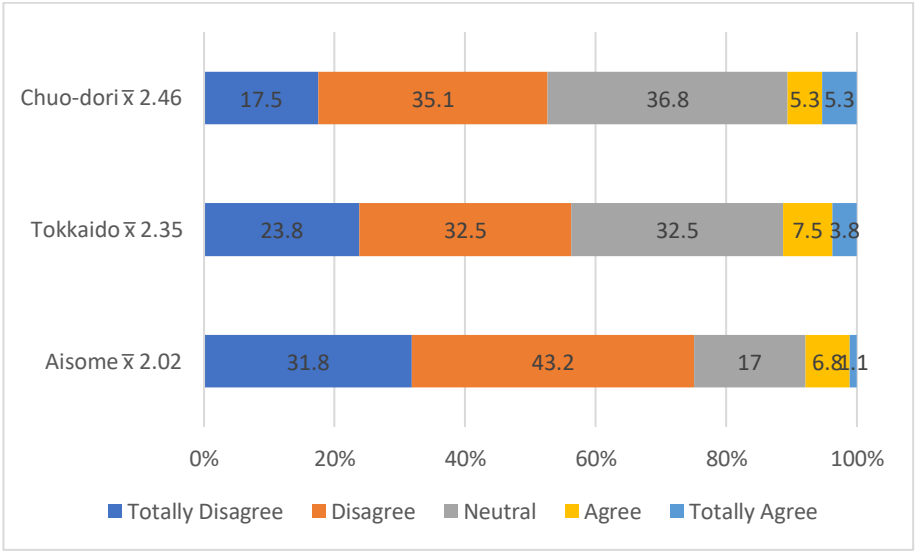

Figure 8.2. 15: Cars should be permanently restricted on this street

Table 8.2. 35: One-way Anova analysis of "Cars should be permanently restricted on this street."

	N	Mean	Std. Dev	df	F	p
Aisome dori	88	2.02	.934	2-232	2.673	.071
Tokkaido	80	2.35	1.045			
Chuo dori	67	2.31	1.033			

8.2.9.3 Cars are a threat to this neighbourhood (3)

There is a general disagreement on the idea that cars are a threat to the neighbourhoods (figure 8.2.16) but the differences across the streets are not statistically significant (table 8.2.36).

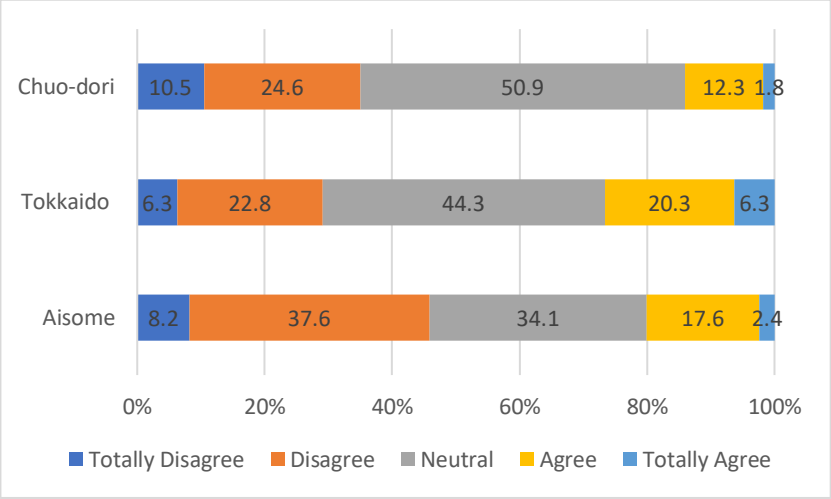

Figure 8.2. 16: Cars are a threat to this neighbourhood

Table 8.2. 36: One-way Anova analysis of "Cars are a threat to this neighbourhood."

	N	Mean	Std. Dev	df	F	p
Aisome dori	85	2.68	.941	2-228	2.491	.085
Tokkaido	79	2.97	.974			
Chuo dori	67	2.69	.891			

8.2.9.4 It is important for cars to pass through this street (8)

There are no clear trends on the importance of cars passing on all streets (figure 8.2.17) but the differences across the cases are not statistically significant (table 8.2.37).

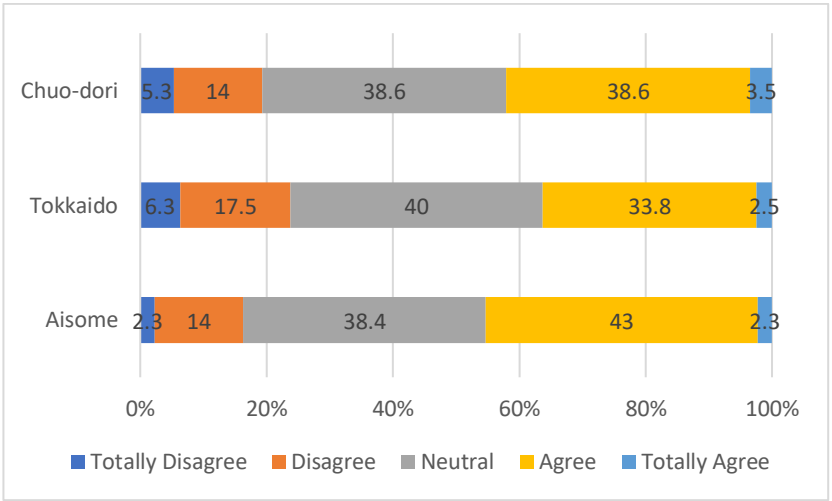

Figure 8.2. 17: It is important for cars to pass through this street

Table 8.2. 37: One-way Anova analysis of "It is important for cars to pass through this street"

	N	Mean	Std. Dev	df	F	p
Aisome dori	86	3.29	.824	2-230	1.137	.323
Tokkaido	80	3.09	.930			
Chuo dori	67	3.22	.885			

8.2.10 Correlation of variables in component 3 against residents' attributes

Results of correlating residents' attributes such as age, gender were correlated against seven variables in Component 3 (table 8.2.38) revealed that the proposition "Activities on the street can cause inconvenience" had a statistically significant correlation to an attribute, gender (Cor=-0.156, p=0.019). The results showed that only "the street is not a safe place ($p < 0.001$)" statistically significantly predict "I like participating in street activities" F (4-223)=7.105, $p < 0.001$, R^2=0.113 as shown in table 8.2.39.

Table 8.2. 38: Correlation of variables in Component 3 against residents` attributes

		Age	Gender	Household Size	Children	House type	Occupation	Length of stay	Car ownership
13.Carfree street events are inconvenient to car owners	Pear Cor	-.105	.017	-.072	-.013	-.053	.004	-.054	-.010
	Sig.	.112	.799	.289	.845	.431	.948	.422	.886
6.Activities on the street can cause inconvenience	Pear Cor	-.068	-.156*	-.088	-.025	-.088	.008	-.049	-.048
	Sig.	.307	.019	.194	.704	.194	.910	.462	.468
9.There is stranger danger for children on this street	Pear Cor	.116	.040	.046	.006	.091	-.029	.038	-.094
	Sig.	.082	.552	.501	.931	.181	.662	.568	.160
16.the street is not a safe place	Pear Cor	-.012	-.120	-.044	-.011	.015	-.018	.005	.091
	Sig.	.852	.072	.517	.867	.822	.783	.941	.171

Table 8.2. 39: Correlation of I like participating in street activities against other variables in Component 3

	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(Constant)	4.946	.347		14.270	.000	4.263	5.629
13.Carfree street events are inconvenient to car owners	-.022	.072	-.021	-.302	.763	-.165	.121
6.Activities on the street can cause inconvenience	-.134	.084	-.112	-1.593	.112	-.300	.032
9.There is stranger danger for children on this street	-.020	.066	-.020	-.302	.763	-.150	.110
16.the street is not a safe place	-.259	.062	-.279	-4.170	.000	-.381	-.137

8.2.10.1 Carfree street events are inconvenient to car owners (13)

There is a general agreement that street activities are an inconvenience to car owners. This is highest in Aisome (mean 3.36) followed by Chuo-dori (mean 3.21) and finally

Tokkaido (3.18) as shown in figure 8.2.18. The differences across the cases are not statistically significant (table 8.2.40).

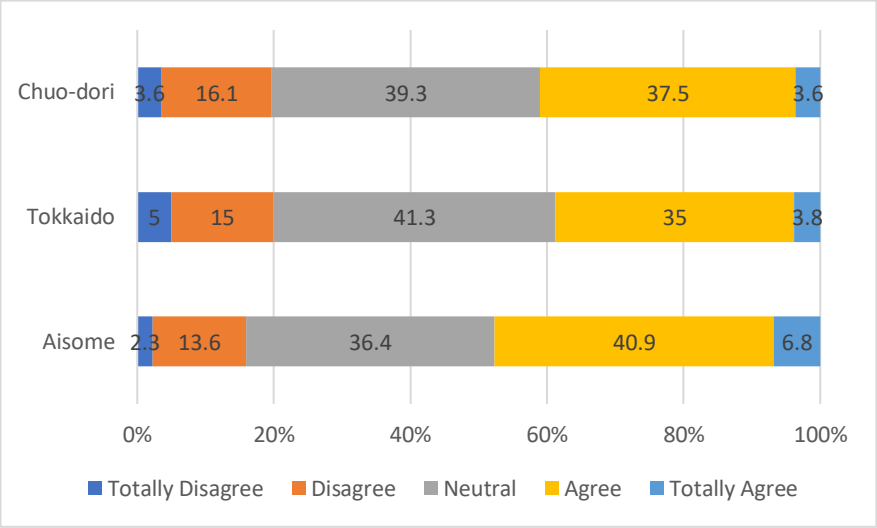

Figure 8.2. 18: Carfree street events are inconvenient to car owners

Table 8.2. 40: One-way Anova analysis of "Carfree street events are inconvenient to car owners."

	N	Mean	Std. Dev	df	F	p
Aisome dori	88	3.36	.886	2-231	.952	.388
Tokkaido	80	3.18	.911			
Chuo dori	66	3.27	.851			

8.2.10.2 Activities on the street can cause inconveniences (6).

Most respondents agree that activities on the street can cause inconveniences (figure 8.2.19). The differences across the cases are not statistically significant (table 8.2.41).

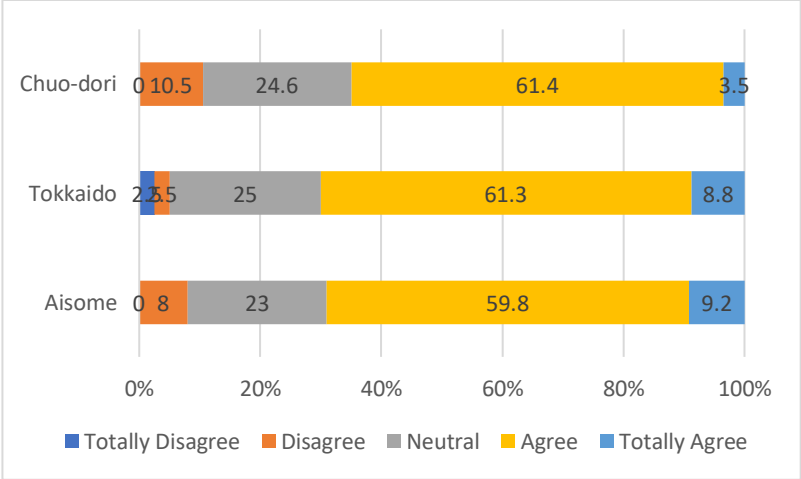

Figure 8.2. 19: Activities on the street can cause inconveniences

Table 8.2. 41: One-way Anova analysis of "Activities on the street can cause inconveniences."

	N	Mean	Std. Dev	df	F	p
Aisome dori	87	3.70	.749	2-231	.512	.600
Tokkaido	80	3.71	.766			
Chuo dori	67	3.60	.740			

8.2.10.3 There is stranger danger for children on this street

There is very little concern for stranger danger in Aisome and Tokkaido compared to the other streets (8.2.20). The differences across the cases are not statistically significant (table 8.2.42).

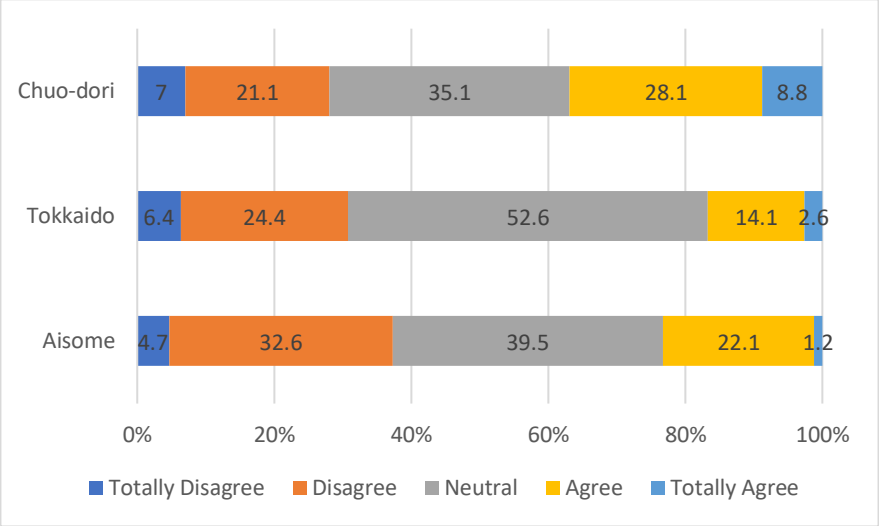

Figure 8.2. 20: There is stranger danger for children on this street

Table 8.2. 42: One-way Anova analysis of "There is stranger danger for children on this street."

	N	Mean	Std. Dev	df	F	p
Aisome dori	86	2.83	.870	2-28	1.820	.164
Tokkaido	78	2.82	.849			
Chuo dori	67	3.07	1.020			

8.2.10.4 The street is not a safe place (16)

There is a general agreement that the street is not a safe place especially in Chuo-dori (mean 3.64) followed by Tokkaido (mean 3.56) and Aisome (mean 3.46) as shown in figure 8.2.21. The differences across the three cases are not statistically significant (table 8.2.43).

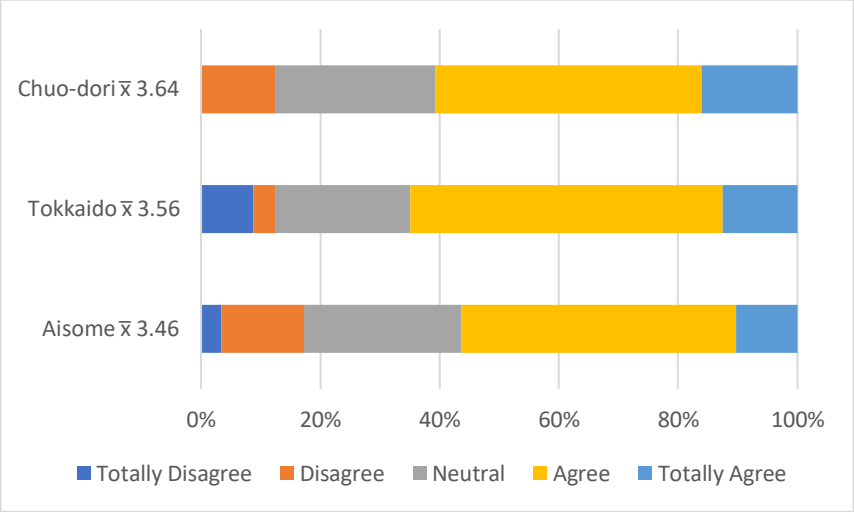

Figure 8.2. 21: the street is not a safe place

Table 8.2. 43: One-way Anova analysis of "the street is not a safe place."

	N	Mean	Std. Dev	df	F	p
Aisome dori	87	3.46	.974	2-230	.630	.534
Tokkaido	80	3.56	1.054			
Chuo dori	66	3.64	.888			

8.2.11 Correlation of variables in component 4 against residents' attributes

Results of correlating residents' attributes such as age, gender were correlated against the two variables in Component 4 (table 8.2.44) showed that they are all significant except gender, children, and car ownership for "4" and all significant except gender, household size, children, length of stay, and car ownership for variable "5." The results showed that both variables in Component 4 "I understand the process of seeking permission for carfree street activities ($p < 0.001$)" and "Children can play even if there is a possibility of cars passing ($p=0.003$)" are statistically significantly in predicting "I like participating in street activities" $F(2\text{-}213)=14.817$, $p < 0.001$, $R^2=0.122$ as shown in table 8.2.45.

Table 8.2. 44: Correlation of variables in Component 4 against residents` attributes

		Age	Gender	Household Size	Children	House type	Occupation	Length of stay	Car ownership
4.I understand the process of seeking permission for carfree street activities	Pear Cor	.315**	.020	.187**	.044	.191**	.152*	.186**	-.121
	Sig.	.000	.769	.007	.519	.006	.027	.007	.080
5.Children can play even if there is a	Pear Cor	.156*	.051	.061	.056	.166*	.147*	.100	-.052
	Sig.	.018	.443	.371	.398	.014	.027	.135	.440

possibility of cars passing									

Table 8.2. 45: Correlation of I like participating in street activities against other variables in Component 4

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	2.617	.163		16.065	.000	2.296	2.938
4.I understand the process of seeking permission for carfree street activities	.177	.049	.239	3.596	.000	.080	.275
5.Children can play even if there is a possibility of cars passing	.158	.053	.199	2.988	.003	.054	.263

8.2.11.1 I understand the process of seeking permission for carfree street activities (4)

Most residents do not understand the process of obtaining permission to conduct street activities (8.2.22). The differences across the three cases were statistically significant (p =0.002) as shown in table 8.2.46.

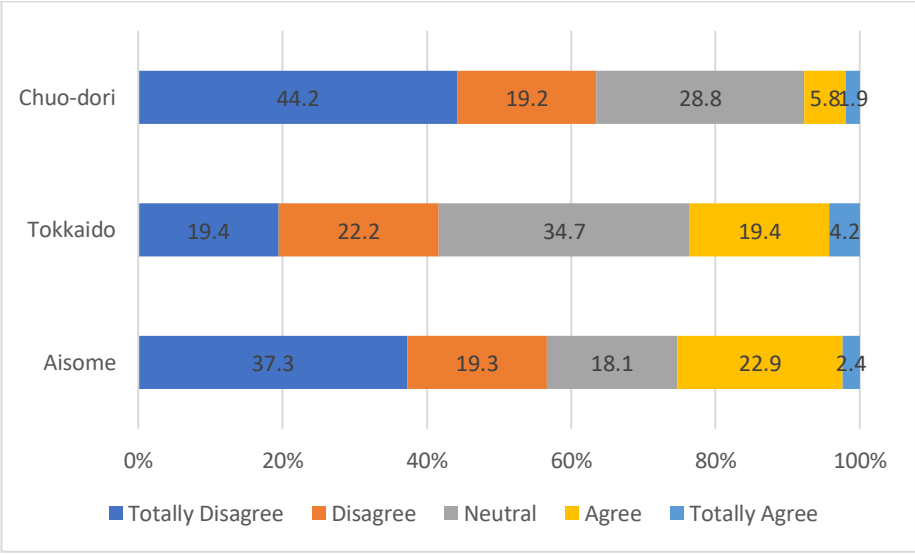

Figure 8.2. 22: I understand the process of seeking permission for carfree street activities

Table 8.2. 46: One-way Anova analysis of "the street is not a safe place."

	N	Mean	Std. Dev	df	F	p
Aisome dori	83	2.34	1.262	2-214	6.254	.002
Tokkaido	72	2.67	1.126			
Chuo dori	62	1.95	1.078			

8.2.11.2 Children can play even if there is a possibility of cars passing (5)

There is greater agreement about children's ability to play on the streets for Aisome street compared to other streets (figure 8.2.23). The differences across the three cases were statistically significant (p=0.000) as shown in table 8.2.47.

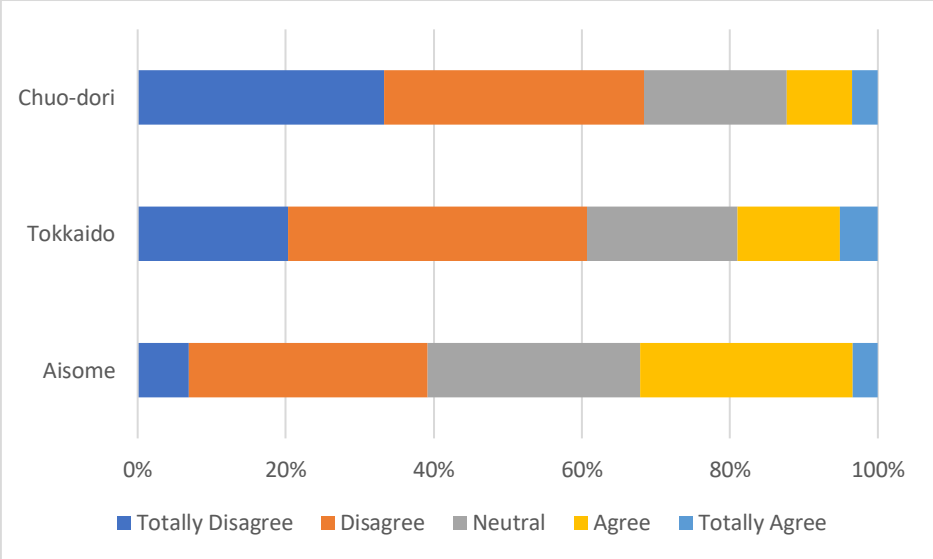

Figure 8.2. 23: Children can play even if there is a possibility of cars passing

Table 8.2. 47: One-way Anova analysis of "Children can play even if there is a possibility of cars passing"

	N	Mean	Std. Dev	df	F	p
Aisome dori	87	2.90	1.012	2-230	9.120	.000
Tokkaido	79	2.43	1.117			
Chuo dori	67	2.18	1.072			

8.3 Chapter Summary

This chapter investigated the quantitative implications of residents' perception of cars in their neighbourhoods, the importance of carfree streets and the activities therein, and the influence of residents' attributes such as gender, age, and car ownership on their perceptions and attitudes. In general appropriation of streets as open spaces is pronounced in well-known and organised activities such as festivals. However, there is little social interaction among residents in daily life. Aisome and Tokkaido streets that are distant from train stations and frequently hold activities are considered safer and good play spaces compared to the others. Residents perception of the transformation of the car street to an open space during carfree events is more pronounced in the streets where people are

used to seeing more elaborate activities and the streets where activities are carried out more often. The study also found significant influences of car ownership on residents' attitudes towards car access into neighbourhoods and the threats they pose.

Chapter 9: Thesis Conclusion and Recommendations

9.1 Reflecting on the results

9.1.1 Reflection on Chapter 1

In chapter 1, this thesis proposed a theoretical framework based on Henri Lefebvre's Production of Space to explain the contestations between various objectives on streets, and the side-lining of stay activities in favour of automobiles. Chapter 1 also expounded the role of cars in the deterioration of urban environments, and various approaches initiated to reduce the negative effects of cars in urban areas of both developed and developing countries.

Through five studies (chapters 4,5,6,7, and 8), this thesis demonstrated the side-lining of pedestrian and stay activities in favour of the flow of cars, the underuse of spaces reclaimed from cars, and the underlying factors that determine the level to which people appropriate carfree street spaces. The discourse attempted to drive the discourse on carfree streets from the mere existence of carfree streets into a discussion about the participation of ordinary people in organising and managing street activities (figure 9.1).

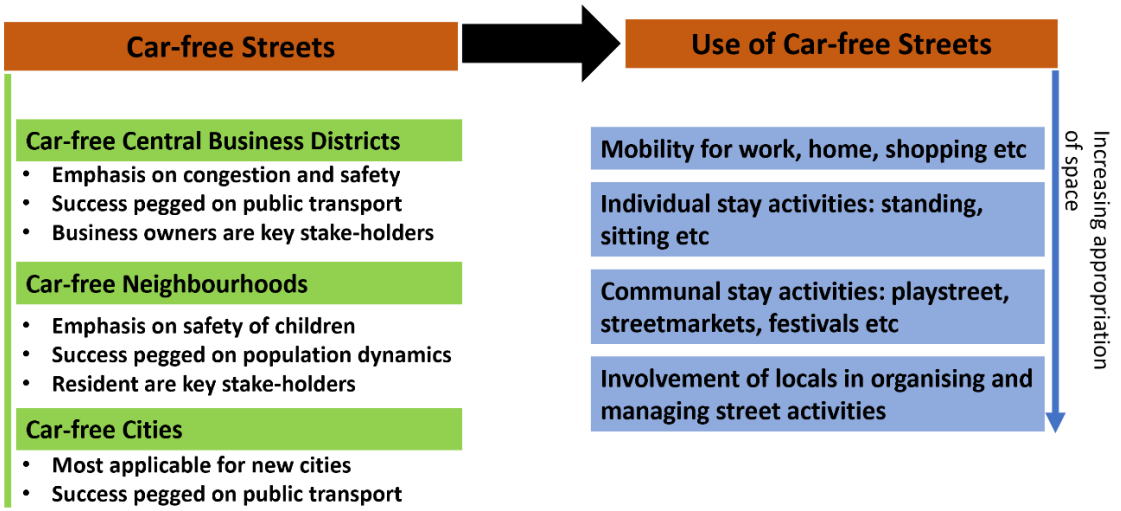

Figure 9. 1: Appropriation of spaces reclaimed from automobiles

9.1.2 Importance of Carfree streets in developing countries

Chapter 4 dealt with the importance of carfree streets in developing countries. Although the amount of stay activities on streets such as street vending, music performances, and household chores are more when compared to developed countries, the gradual invasion of cars is causing undue gentrification. However, due to lack of carfree schemes in neighbourhoods, this study focused on the Nairobi Central Business District. Based on pedestrians' responses regarding 37 variables on a likert scale of five levels, results show that in general, pedestrians' evaluation of carfree streets is high regarding safety, comfort, and convenience compared to one-way streets and streets with cars.

Contradictions in streets of developing countries is visible in pedestrian's priority for removing matatus, the public transport vans (41.1%) whereas they need them to access the city (35.2% of all work trips in 2013 were made by matatu, Nairobi County Government, 2015). At the same time, although the carfree streets ranked highest on other variables regarding safety (table 4.1), safety at night ranked lower than the one-way street (2.87 against 3.07) due to poor landscape design and its location in isolation from major pedestrian traffic; access to public transport was also evaluated poorly on the carfree street compared to the car street (3.10 against 3.22) due to poor linkage to public transport (matatu and bus stations). The study also showed the contradiction in policies that aim to decongest areas with high-class premises while ignoring the challenges in congested downtown areas that have more pedestrians. As shown in figure 4.7, most concerns about car traffic regard the downtown area whereas the only attempt at a one-way street in the last decade was on Mama Ngina street in the uptown area.

There is also a need to create Rapid Transit Systems as well as underground and aboveground connections that link carfree areas and public transport stations. A combination of "temporary carfree streets" in areas that need car access, "carfree precincts" with public transport terminals in the periphery or subway is essential; cost effectiveness will be a critical issue for developing countries. Traffic calming models such as "Home zones" discussed in Chapter 2 will be critical in neighbourhoods although issues of driver discipline and consequent congestion in areas outside the home zones need to be addressed.

The success of shopping streets in Japan is a good indicator of cheap starting points for developing countries. Their location adjacent to train stations ensures that carfree schemes achieve a safe and comfortable shopping environment without undermining accessibility. As seen in Chapter 5, carfree shopping streets are critical elements of neighbourhoods, and residents appreciate the influence of carfree conditions. The rationale for carfree schemes in developing countries needs to be anchored on the needs of surrounding neighbourhoods, the costs involved, and the level of political will required to change the systems.

9.1.3 Reflections on Chapter 5

Chapter 5 investigated the importance of local shopping streets in Japan as spaces for community activities through a survey targeting residents living in the surroundings of two streets in Tokyo. The study established that residents frequent the nearby shopping streets for daily-use goods (41.8% in Pearl Centre; 67.1% in Honcho-dori) but with little interest in social interactions or communication (only 1.8% in Pearl Centre and 3.5% in Honcho-dori think that social interactions are very important). The main reason for

choosing the local street was proximity to their homes (44.6% in Pearl Centre; 65.3% in Honcho-dori) although the absence of cars or temporary carfree hours (18.1% in Pearl Centre and 7.4% in Honcho-dori; $p=0.01$) were significant influences. The challenges when utilising carfree streets are specific to each street depending on the physical settings and facilities, especially regarding overuse of bicycles (23.5% in Pearl Centre and 48.6% in Honcho-dori; $p<0.001$) and lack of bicycle parking (21.6% in Pearl Centre and 1.4% in Honcho-dori; $p=0.001$). These findings were critical in focusing the direction of consequent studies in Chapter 6, 7, and 8.

9.1.4 Reflections on Chapter 6

Chapter 6 demonstrated the changes in stay activities such as sitting standing and children's play in varying levels of car traffic. Through mapping of stay activities, this study established that during weekdays when cars traverse the two streets, there are minimal stay activities except those linked to adjacent business establishments such as restaurants. Additionally, carfree hours on weekends do not have a significant influence on stay activities on the space reclaimed from cars as activities tend to be aligned to the sidewalk and adjacent shops; only bicycles seem to benefit from the carfree environment. However, organised street activities such as playstreet and music performances increase the use of carfree spaces for stay activities as well as improvisation of street elements such as bollards and kerbs.

9.1.5 Reflections on Chapter 7

Chapter 7 was based on the author 's participant observation in street activities, and interviews with key stakeholders and academics. The study established that the success of neighbourhood streets such as Tokkaido in Kita Shinagawa and Aisome in Bunkyo

ward emanates from their unique history and relationships between residents and the community leadership; integration of play leaders and other "experts" and facilities such as mobile play trucks to liven the street activities during carfree hours were instrumental. The cooperation of shop owners and the history of positive relations between shopping streets associations and the police was also established as a direct contributor to successful carfree street activities. In successful carfree neighbourhoods streets, specific activities are viewed as part of a greater project to enrich the community relations of the community with particular emphasis on children's safety.

9.1.6 Reflections on Chapter 8

Chapter 8 synthesised aspects of community relations and street activities observed in previous chapters and used them for a quantitative analysis of the relations between cars, carfree environments and local residents of four neighbourhood shopping streets. From the survey, appropriation of local streets is limited to traditional and special events such as street festivals (38.7% in Tokkaido, 32.9% in Chuo-dori, and 26.3% in Aisome). However, variations in people's participation and willingness to participate or organise in the future are dependent on their exposure to street activities; willingness to participate is highest in Tokkaido, 51.3%, and lowest in Chuo-dori, 22.2%. Chuo-dori also ranks lowest in participating in activities of neighbourhood associations, 30.8% while Tokkaido was highest, 58.2%.

Additionally, residents around Chuo-dori which has many street markets were keen on selling during street markets while residents near Tokkaido are keener on festivals that are common in the neighbourhood; the neighbourhood also has high participation rates in local community associations. Nevertheless, interactions among residents are not

statistically influenced by personal attributes such as gender, age, occupation and car ownership as compared to their involvement in local community associations that is significantly influenced by attributes such as age ($p=0.012$), household size ($p<0.001$), and years lived in the neighbourhood ($p<0.001$). The perception of *streets as spaces for cars not for stay activities* ($p<0.001$), *the need for cars to pass in the neighbourhood streets* ($p=0.002$) as well as the *threat posed by cars* ($p=0.017$) had a significant relationship with car-ownership. The results also indicate that preference for participating in street activities has a statistically significant correlation to attitudes on car restrictions.

In summary, the study`s responses to the four objectives stated in chapter 1 are as follows:

I. To describe the nature of stay activities on carfree streets

Stay activities on carfree streets are minimal in the day-to-day life of people in residential neighbourhoods in Japan; most people only use streets for mobility. Although stay activities are generally limited to children`s play with adults as mere observers during organised events, there are exceptions whereby the liveliness of street activities evokes a sense of "open space" that encourages people to undertake stay activities such as conversations among adults as well as street drinking parties; people also get more innovative in utilising street elements such as kerbs and bollards, and engaging in activities that are rare in day-to-day life such as eating on the street. The case of Nairobi depicts great appreciation of carfree streets as open spaces for human interactions and stay activities such as sitting, peddling and hawking items, and street performances on carfree streets.

II. To establish challenges in people's attempts to utilise adjacent street space

The challenges in appropriating street spaces go beyond the apparent physical problems brought by cars. Even when cars are excluded from streets, people do not automatically consider emergent spaces as "open spaces" for stay activities. Although there is a split between people interested in participating in street activities and those who do not want, only a small proportion is interested in organising anything on the street. Attitudes and behaviours inculcated in childhood as well as changing lifestyles have reduced the significance of streets in light of alternatives such as parks.

III. To establish how residents perceive street spaces with regard to cars and street activities

The perception of local residents regarding cars and carfree street activities largely depends on their exposure to street activities. Generally, people do not mind restrictions on cars in major shopping streets but there are mixed reactions regarding car restrictions in residential areas. There are however variations depending on attributes of the residents such as car ownership.

IV. To determine the relationship between governments priorities and people's lived reality in the use of street space

People`s needs in streets is incongruent to the priorities of government agencies. In developing countries where open spaces have more functional and necessary significance as places of resting and trading, people's intentions to appropriate space and the emergent conflicts with cars is more evident. Contrary, for Japan where people have more options, it is easy for them to suppress their desire for liberty in using street spaces, ignore the adjacent street spaces, and utilise designated spaces such as cafes and parks. In sum, the prioritisation of infrastructure projects for automobiles in developing countries and the

profound pursuit for orderliness (such as flow of traffic) in Japan is inconsiderate to the realities of the majority, those who do not own cars as well as those consider adjacent streets as part of the home environment.

Each of the models discussed in chapter 2 is adaptable to a specific set of settings but has lessons to contribute to other situations. The influence of economic development, population dynamics, and car ownership discussed in this thesis forms an example of how research studies can be used to adapt various models appropriately as shown in table 9.1

Table 9. 1: Carfree models and their adaptability to socio-economic conditions

Model	Advantages	Disadvantages	Adaptability
Carfree Sundays	•Easily accepted because of the temporality •Promise health benefits and change to car owners	•Short-lived	Good as a starting point to advertise the benefits accrued by carfree environments
Carfree cities	•Cover large areas •Additional environmental benefits such as reduced emissions	•Works best only for new cities whose architecture and planning is carfree oriented •Require immense political will •Few complete cases	Appropriate for places with underground Mass Transit systems
Carfree housing	•Provides significant safety for children to play in neighbourhoods •Based on consensus among residents or embedded in housing contracts	•Maximum safety depends on discipline and cooperation by residents •Traffic is spread into neighbouring streets	Can be adapted into existing neighbourhoods in a gradual process
Woonerf & Home zones	•Middle between relinquishing and retaining cars •Provides significant safety for children to play in neighbourhoods	•Expensive to install barriers and restructure streets •Conflicts with guardians of standardised streets	Adaptable to neighbourhoods with children and elderly
Carfree city centres	•Improve safety, comfort, and convenient of pedestrians •Improves business	•Requires immense political will due to opposition by business owners	Adaptable where buildings do not have underground parking
Carfree Shotengai	•Improve safety, comfort, and convenient of pedestrians •Improves business	•Only applicable for short sections of streets •Requires immense political will due to opposition by business owners	Adaptable for shopping areas especially for temporary carfree
Intrinsic Carfree	•Mostly in isolated areas such as island hence car-invasion is rare	•Cannot be adapted in new areas with existing car- •oriented networks; merely for learning	-

	•Architecture and planning do not provide for cars		

In addition to the socio-economic aspects of carfree streets discussed above, the physical settings of streets are critical determinants of the adaptability of carfree models (table 9.2).

Table 9. 2: Adapting carfree streets to varying physical street conditions

	Key Variables	Adaptability to various Countries
Street Design	•Width of street, and its influence on traffic speed and human scale •Length of stone pavers and paving patterns: stone pavers the size of the human foot create human scale in streets •Dead-end streets or cul de sac discourage through traffic and are easier to convert to carfree	•Narrow streets such as in Venice, Italy and Tokyo, Japan allow for more intimate interactions in carfree streets but offer no space for street furniture. •Dead-end streets were typical for historical cities in Egypt and Italy as a war defence mechanism. Also common for UK streets designed in the "Garden City Movement" era
Adjacent Buildings	•Height of buildings •Size of windows and doors •Orientation of building entrances and windows in relation to the street •Basement parking •Sensitivity to traffic and security •Function of building	•Relatively short buildings such as in Japan`s shitamachi allow for human scaled carfree street spaces that are more welcoming for pedestrian movement and stay activities •Buildings oriented towards streets are more attractive for stay activities due to the connection of indoor and outdoor spaces, private and public spaces. •Gated communities common in America discourage public use of spaces; the fencing creates a barrier between public and private spaces •Small windows and doors such as in Sienna create human scale and create a relaxed feeling for hanging out in a carfree street •Permeable and personalised buildings as well as those with Niches attract stay activities that enhances the liveliness of carfree streets
Street Furniture	•Only feasible for wide streets •Depends on the level of obstruction they cause on businesses •Bollards and kerbs	•Incorporation of furniture discouraged in many developing countries to reduce stay activities by criminals and to reduce political gatherings •Furniture common in wider contemporary carfree streets in America and Europe to encourage stay activities and liveliness •Depends on street width and the possibility for necessary access such as emergency vehicles •Other street elements such as bollards and kerbs offer additional sitting areas but may also create obstructions in carfree streets
Land use Context	•The need for through traffic •Land uses in the surrounding areas	•Carfree streets more appropriate for land uses with little access demands. American cities and cities in developing countries have greater needs compared to Japan.

Alternative Transport Modes	•Availability of public transport systems such as trams •Availability of options for non-car users such as the elderly and physically challenged	•Streets with alternative modes such as Trams in Istanbul, Turkey are easier to establish carfree streets •Small cars moving at walking speed can share street space with pedestrians, while ensuring convenience of elderly and physically challenged people
Vegetation	•Trees and shrubs help in air purification hence creating a comfortable carfree environment •Large trees offer shade hence facilitating hanging-out and other stay activities	•Narrow streets in Japan and low maintenance standards reduces the effectiveness of large trees compared to less dense countries such as Kenya •Potted plants in Japanese neighbourhoods create a friendlier environment for residents and visitors
Public Amenities	•Free toilets in public spaces offer an additional incentive to attract stay activities •Nearby parks attract people to stay longer in the carfree area; passers-by add liveliness to the street	• Countries such as Japan and America that have accessible public toilets are better placed for carfree streets in Central Business Districts and tourist areas as compared to Kenya and other developing countries

9.2 Automobile domination and the implications of abstract space

Automobiles remain critical components of urban life; without a major shift in the physical or social environments, people will continue to rely on them for access to their homes and business premises. Although the study has evaluated many successes, current carfree schemes have largely failed to transition streets from mere mobility to their consideration as public open spaces.

Deterioration of urban spaces by automobiles is not merely physical, but also an attack on people`s consciousness. The car as a tool for exercising democratic movement also enslaves people, and even when the struggle is over, the consciousness is still bound. Domination by machines partly dwells in people`s consciousness and continues even after the physical object is removed from the street; people who are used to viewing the street as a mobility channel do not change their perception immediately carfree streets are

established. The resultant space is neither optimal for public and private life nor does it afford the connection of privates into a public commons.

Although Lefebvre explained the general implications of government`s abstract space on the appropriation of space, most of today`s contestations do not involve physical force and violence compared to previous centuries. The situation in Japan is in some way "self-imposed" regulation where carfree streets are designated by the government yet people do not see the need to utilise them for stay activities. The police rarely use force to prevent people from using street spaces but people are already used to other third-places such as parks, malls, coffee shops, and indoor play spaces. Coupled with enhanced long-distance mobility across metropolitans, use of streets for stay activities in daily life is diminishing.

Gradually, automobile dominance has led to decline in sense of community; efforts by local neighbourhood associations and NPOs to organise events have been successful in the short-term but with little effect in daily life. Government agencies have hence capitalised on this disengagement to present residents with a homogenous space that emphasises mobility and dictates the extents to which they can appropriate streets in their daily life.

9.3 Extended benefits of carfree streets and the activities therein

Success of carfree streets has impacts on many other aspects of urban life such as enhancing the physical environment, improving business, and building community cohesiveness (figure 9.2). The street as an open space is critical not only for recreation but also as a common space for community activities. As the closest space to human dwellings, people should be encouraged to view the street as a place for building a

Psychological Safety Network that sustains communities in times of vulnerability such as after major earthquakes.

Figure 9. 2: benefits of car-free streets. Source: Author

The unconventional landscape that emerges during carfree street activities also offers children a chance to be more innovative and creative, to understand and contribute in the affairs of their neighbourhood, and to teach others (figure 9.3).

Figure 9. 4: The author learning Japanese games from children during

The street activities also enhance intergenerational communication between children and adults of various age-groups while also teaching children other community aspects such as fire-fighting and cleaning (figure 9.4). This study also generated interest in both adults and children interested in learning about alternative conceptions of street spaces; the author was invited to present ideas to share ideas with junior high school students in the Kita-shinagawa exchange house as well as a presentation to experts concerned in creating street parklets.

Figure 9. 3:: Children learning about communal activities

Effects of carfree streets also impact adjacent neighbourhoods, regions, the nation as well as the global scale (figure 9.5). For example, traffic restrictions in one area affect other

parts of the neighbourhood where cars are diverted to. On the other hand, global, national, regional, and neighbourhood scale aspects also have an effect on the local street; cultural attitudes and technological transfers are good examples.

Figure 9. 5: Effects of carfree streets at different scales. Source: Author

9.4 Contribution to global efforts

Developing countries often follow social advancements in more developed countries in the same way they are adapting to technological developments such as in car use. As the world aims at sustainable development by 2030 through 17 Sustainable Development Goals (SDGs), carfree streets will be of direct influence in *reduced inequalities* (10) in the use of communal spaces and mobility choices, *sustainable cities and communities (11)*, and ensuring *responsible consumption and production (12)* regarding automobile ownership and use. Proper articulation of these aspects will have indirect benefits to *good health and well-being (3)* because of the reduction in environmental pollution as well as the health benefits associated with outdoor activities. Since automobile ownership and

the negative effects have gender-based manifestations, benefits of carfree streets will be critical in enhancing *gender equality (5)* especially in developing countries. Ultimately, the benefits will contribute to *climate action (13), life below water (14),* and *life on land (15).*

9.5 A shift forwards in the use of carfree streets

The cases presented in this thesis show that the creation of carfree streets is insufficient in itself; there is need to utilise the emergent space. For the streets that have been holding activities often, the feeling of safety and the openness to children playing on the street is higher and encouraging. Optimum utilisation of these spaces will depend on the inclusivity of activities to adults especially those without children. For neighbourhoods, residents have a high regard to car access while at the same time considering the street as part of home; a place to interact, and get entertained. For more commercial spaces, people are not keen on access by cars and are very open to carfree efforts.

The study shows that history of neighbourhoods and carfree street activities is a great influence on current progress. At the same time, population dynamics and technological advancements have been referred to in explaining the future of people and cars. The possibility for a paradigm shift in people`s regard for carfree streets thus depends on both linear models aiming at incremental changes as well as sudden changes in the physical and social environment. Current efforts must be viewed in relation to the past that has generated today`s successes as well as future challenges and potentials. The street is part of a wider urban landscape. Even though this thesis is anchored on the role of community in reclaiming adjacent streets from automobile, success in transforming streets into "urban open spaces" will depend on collaboration with other stakeholders. Landscape

architects and academics who can share new ideas and evaluate current progress are important in helping local communities.

9.6 Limitations

Research projects do not always work perfectly as planned, and this was not an exception; a few things were altered while others were abandoned in response to unavoidable changes encountered during the process. For observation of street activities, a major challenge was collecting data while participating. As a volunteer and a partner with other organisers of the events, the author`s ability to observe, take notes, and interview participants was often hampered by other roles such as playing with children. Due to the author`s limitations in the Japanese language, planning for some of the interviews took longer because of the need for translators; translation of questionnaires to Japanese and back to English for analysis also took longer than expected. Additionally, results of Howdy Mall were not included in chapter 6 because of low response.

9.7 Application to Future Studies and Projects

This study significantly adds to current understanding on the influence of cars in neighbourhoods, various models that have been devised to address the challenges of automobiles dominance and inactivity in carfree streets. The study results and discussions will be instrumental to policy makers considering regulation of automobiles access and circulation in neighbourhoods as well as residents and local leaders keen on undertaking activities on street spaces reclaimed from cars. Nevertheless, a few tools will be critical accompaniments in the application of knowledge derived from this thesis in order to get the most out of its contents:

- **Development status**: automobile-related challenges in developing countries vary greatly from their developed counterparts. With economic and population growth, continued importation of cheap used cars, and expansion of mobility infrastructure, combating the invasion of cars into neighbourhoods and Central Business Districts will be a daunting task in developing countries. The breakdown of community relations in developed countries due to increased independence and extensive mobility patterns reduces the significance of local streets and leaves them to the controls of capitalism and government bureaucracies.
- **Population dynamics**: As shown in Chapter 8 as well as the case study of Pontevedra in Chapter 2 where banning of cars has encouraged young families to move in, the particular population attributes of each neighbourhood or city are critical determinants of the need for carfree streets and the appropriate models to be taken. Cities in decline can utilise carfree streets as safe open spaces for recreation to enhance the liveability; this may in turn restore their vitality.
- **Leadership:** As seen in interviews in Chapter 7, specific to organising street activities, the influence of leadership by residents, shopkeepers, as well as the organisations such as shopping streets association is important for success of projects. Top-down initiatives are appropriate for controlling access of automobiles to increase safety but are not useful in ensuring that the spaces reclaimed from cars are utilised for stay activities.

The cumulative effect of carfree streets at city-wide levels has not been covered in this study; it will be interesting to see the relationship between piece-meal initiatives and the overall functioning of cities in future studies.

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Appendices

Appendix 1: Nairobi Questionnaire

K 25

CHIBA UNIVERSITY
GRADUATE SCHOOL OF HORTICULTURE
648 Matsudo, Chiba Prefecture 271-8510, Japan

CHIBA UNIVERSITY

Potential for Livening Urban Areas in Developing Countries through Carfree Streets

Declaration: This Questionnaire is part of a study on the *Potential for Livening Urban Areas in Developing Countries through Carfree Streets* in partial fulfilment of the requirements for Doctor of Philosophy, PhD. Any information provided is confidential and will be used for academic purposes only.

Date: ..... *Time:* ..... *Location:* ..... *Activity* Standing

1.0 Engagement with the street

1.1 Why are you on this side of town today?
[Shopping] [Business] [Government Office] [Workplace] [Meeting a friend] [Relaxing]
Others.....

1.2 How much time have you spent on this street today?
[<1min] [1-15min] [16-30min] [31-60min] [>1hr]

1.3 How often do you use this street?
[Daily] [Weekly] [Monthly] [First time] Others, ...

1.4 Which establishment(s) along this street have you entered today?
[None] [Restaurant/Coffee shop] [Cybercafé/Printing] [Electronics] [Fashion] [Office] [Bank/Mpesa]
Others, please state.....

2.0 Consciousness regarding street conditions

2.3 How satisfied are you with the following issues?

		Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
	Pedestrian-friendliness		✓			
Safety	Safety from strangers	✓				
	Safety from crime	✓				
	Safety from traffic accidents		✓			
	Safety from anti-social behaviours	✓				
	Safety to use this street at night	✓				
	Safety for children or elderly		✓			
	Actions of beggars			✓		
	Actions of street preachers			✓		
	Actions of hawkers			✓		
Comfort & Convenience	Paving condition		✓			
	Attractiveness of surroundings			✓		
	Opportunities to stand on the street		✓			
	Opportunities to sit along the street		✓			
	Number of people/congestion/crowding			✓		
	Ability to talk or hear others		✓			
	Freedom from obstacles when moving		✓			
	Ability to participate in street activities			✓		
	Shade/cover from adverse weather			✓		
	Sufficient width and spaciousness				✓	

1

K 25

	Greenery e.g. trees and flowers	✓				
	Pleasantness regarding smell	✓				
	Pleasantness regarding noise	✓				
	General cleanliness of the street	✓				
	Good mix of uses, shops, and restaurants		✓			
	Availability of dust bins		✓			
	Availability of toilets		✓			
	Opportunity to interact with others			✓		
	Liveliness of the street			✓		
Access & Connectivity	Ease of accessing the street on foot			✓		
	No physical barriers e.g. walls & fences		✓			
	No need to cross busy traffic street		✓			
	Directness of the street		✓			
	Access to your destination			✓		
	Access to matatu/bus stage			✓		
	Access to car parking		✓			
	Connection with neighbouring streets			✓		
	Visibility of other activities from the street		✓			

Consciousness to automobiles

3.4 Do you think that we should make some streets to be carfree? [Yes] [No]

3.5 Which vehicles would you like excluded from such streets?
[Private cars] [Matatus] [Bodaboda] Others.....

3.4 Which street would you want cars removed temporary?
[Mama Ngina] [Tom-Mboya] [Moi Avenue] [Koinange] Others.....
Why? congestion

3.4 Which street would you want cars removed permanently?
[Mama Ngina] [Tom-Mboya] [Moi Avenue] [Koinange] Others.....
Why? congestion

3.5 Do you own a car? [Yes] [No]

Personal information
Age: [Below 20years] [20s] [30s] [40s] [50s] [60s] [70s] [80s] [90s] [100years and above]
Gender: [M] [F]
Occupation: [Student] [Self-employment] [Formal Employment] [Informal employment] Others.....
Education level completed: [Primary] [Secondary] [Tertiary College] [Graduate] [Post-graduate]

Thank you very much for taking your time to contribute to this study

Appendix 2: Sample explanation sheet for Questionnaires

三鷹中央通り周辺にお住まい・お勤めの皆様

2018年10月11日

千葉大学大学院　園芸学研究科
環境造園学領域　地域計画学研究室
博士課程　アントニー・ムリティ
（指導教諭：木下　勇　先生）

中央通りに関するアンケート調査ご協力のお願い

私はケニア出身のアントニー・ムリティです。千葉大学の博士課程の大学院生です。現在、「道路での活動」に関する研究をしています。2014 年に、日本に来た時から、日本の道路での経験がとても興味深く思いました。地域の方が道路空間でどのような活動をしているかの調査をしています。

これまで、私は、都内で道遊びや、商店街の活動にも参加してきました。三鷹中央通りでは、遊び場の活動へ参加しました。今回は、地域の道路を使うことで考えられる問題などについてみなさんのご意見をお伺いし、より良い道路環境づくりのための研究にいかせたらと思います。また、中央通りを活性化させるためには何をすることが必要だと思うか教えてください。

お忙しいところお手数をおかけ致しますが、アンケートにご協力の程よろしくお願い致します

〈アンケートについて〉

（1）対象者：三鷹中央通りから半径約 1km 圏内にお住まいの方へポスティングにて配布しています。

（2）所要時間：アンケート票の記入に要する時間は、５～１０分程度です。

（3）返信方法：アンケート票は、同封の返信用封筒にて、ご返送ください。（切手は不要です。）

〈回収期間〉　2018 年　10 月 26 日（金）までにご返送ください。

本アンケートで得られた情報は集計し、研究論文や発表に使用させていただきます。その際、千葉大学倫理規定に基づき処理し、アンケートに回答された個人が特定されるような形で公表されることはございません。また、このアンケートで入手した情報は研究室にて厳格に保存します。

担当及び連絡先
千葉大学大学院　園芸学研究科　環境造園学領域　地域計画学研究室　博士課程　アントニー・ムリティ
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Appendix 3: Sample Questionnaire

a71

道路での活動研究：アンケート調査

千葉大学大学院園芸学研究科
2018 年 7 月

以下の質問に答えてください。

1. あいそめ通りの良い点として何が考えられますか？
   お書きください
   .....

2. あなたは、この通りでどのような活動に参加しましたか？
   □祭り　□道遊び　□イベントなどで何かを売った　□イベントなどで何かを買った
   □飲み会　□立ち話　□立ち止まる　□座　□家事　□その他.....

3. あなたは、隣近所の人と、どの程度の頻度で話しますか？
   □全く話さない　□一年に一度かそれ以下　□年に数回　□月に一度
   □月に数回　□週に数回　□毎日のように話す

4. この地域の町会や商店街の活動に参加してきましたか？
   □はい　□いいえ

   「はい」の方は、どの役割ですか？
   □長（リーダー）　□活動などのリーダー　□参加者　□その他.....

   「いいえ」の方は、なぜですか
   □活動に気がつかなかった　□面倒臭いから　□近所づきあいが苦手　□その他.....

5. この通りで、あなたが参加したい活動はありますか？
   □はい　□いいえ

   「はい」の方は、何かを書いてください。.....

6. この通りで、あなたがつくりたい活動はありますか。　□はい　□いいえ
   「はい」の方は、何かを書いてください。.....

7. 車を持っていますか。
   はい・いいえ

   「はい」の方は、どのくらいの頻度で車を使いますか。
   □一年に一度かそれ以下　□年に数回　□月に一度　□月に数回　□週に数回
   □毎日のように

裏面に続きます

1

8. 以下の項目で、どの程度、同意するか、しないかの程度を記入してください。

	1: 全く同意しない	2: 同意しない	3: どちらでもない	4: 同意する	5: 強く同意する
道路は、地域の活動のための空間である	□	□	□	□	✓
道路での活動に参加することが好きだ	□	□	□	□	✓
車は、地域にとって脅威である。	□	□	□	✓	□
私は、道路での活動が許可された経緯を知っている。	✓	□	□	□	□
通りは車が通る可能性があるが、子どもは安全に道路で遊ぶことができる	□	✓	□	□	□
道路での活動は、迷惑をかける場合がある。	□	□	□	✓	□
この道路に来るとリラックスして過ごせる。	□	□	□	✓	□
車が、この道を通ることは重要である。	✓	□	□	□	□
道路を通る見知らぬ人は、子どもにとって危険を感じる。	□	□	□	✓	□
道路でのイベントによって、道路が、公園のような屋外空間であると感じるようになった。	□	□	□	□	✓
子どもは、車両通行止めの時間の間、遊ぶことができる	□	□	□	□	✓
車は、特定の時間に制限されるべきである。	□	□	□	□	✓
自動車の所有者にとって、道路での活動は、迷惑がかかる。	□	□	□	✓	□
道路で、活動をする必要はない。	✓	□	□	□	□
道路は自動車のためのものであり、オープンスペースではない。	✓	□	□	□	□
道路は安全な場所ではない。	□	□	✓	□	□
車は、この道路で、常に進入禁止されるべきである。	✓	□	□	□	□

個人の情報
年齢: [<20 年] [20 代] [30 代] [40 代] [50 代] [60 代] [≥70 年]
性別: [男] [女]
世帯の人数: [1] 人　**小学生以下の子ども** [　]歳　[　] 歳　　[　] 歳
住まいの形態: アパート[ ] マンション[✓] 戸建住宅[] 寮・シェアハウス[]
職業: [自営業]　[正社員]　[パート．アルバイト]　[学生]　[主婦] [無職]
年数: [1 年未満] [1−2 年] [2−5 年] [5−10 年] [10 年以上]

お時間をいただき、ご協力いただきありがとうございました。

ご意見、ご質問があれば、こちら(afta8857@chiba-u.jp)までご連絡ください。

Appendix 4: Interview guide

Anthony Murithi Carfree Street research July 2017

USE OF CARFREE STREET SPACE BY LOCAL COMMUNITIES

Interview Guide

Interviewee:	**Date:**
Place:	**Time:**

Streets are a key open space in Japan`s urban areas whose domination by cars continues to push away pedestrians` social and recreational activities. Attempts to reclaim the streets, such as play streets have been on a decline, and the liveliness and use of street space for stationary activities remains minimal. Additionally, the participation of local communities in organising activities such as street play is largely limited to NPOs and machizukuri leaders.

This research is based on the assumption that with exclusion of cars, (whether temporally or permanent) Japan`s neighbourhood streets can function as the primary open spaces for the local community to self-express through modelling and appropriating them. Stationary activities such as standing, sitting, eating, and children play have been evaluated through observation techniques in carfree streets and carfree hours in various neighbourhood commercial streets. This study aims at getting a deeper understanding of the issues behind the low participation by locals and what can be done to enhance the liveliness of the streets.

The information you give will be treated with utmost confidentially, and for research purposes only. your name will not be stated in the research thesis.

自分の経験：道路での活動、都市計画、まちづくり
Personal experiences regarding street activities/planning

I. 都市計画や道路に関連する活動にどのぐらいの期間参加しましたか？
For how long have you been involved in urban planning? Kindly tell me about your involvement in street-related issues if any

II. 幼い頃，道で遊んでいましたか？この経験を説明してください
Did you often play on the street as a child? Kindly share your experience

III. 地元の道路と、他のオープンスペース（公園や寺院）の違いは何だと思いますか？
In your thinking, how do local street spaces differ from other open spaces (such as parks and temples) in urban areas?

IV. 一般に道路と他の道路を識別するための特徴は何だと思いますか？
What would you say are the characteristics that differentiate one local street from another?

V. 現在，街路空間の利用方法は，歩行以外にありますか？
Apart from walking, how else do you use street space nowadays?

車の影響／車乗り入れ禁止における活動について
Influence of cars/carfree activities

VI. 人が街路空間を理解する仕方として，車はどのように影響していると思いますか？
How have cars influenced the way people understand street space?

VII. 車乗り入れ禁止場所・時間における道のイベントに参加したことがありますか？
Could you describe your participation in street events in carfree space/time?

VIII. 車両通行の規制されたイベントの際、道路の景観はどのように変化しますか（一時的であっても）
In your participation in carfree activities, how does the look of street landscape change, even temporarily?

日本街路空間の一意性
The uniqueness of Japan social street space

IX. 日本の近隣の通りで屋外活動（食べる、座るなど）はあまり行われていません。なぜですか？
In Japan neighbourhood streets, there is very little use of street for outdoor activities e.g. seating or eating. What are the main reasons?

X. 日本の屋外での活動(道遊び、催し物、グループで集まること)において、禁止されているルールは何ですか？
What rules in Japan work against outdoor activities such as street play, performances or group meetings?

XI. 親さんや子供などそんなルールをどれくらい知っていますか?
How much are local adults and children aware about the restrictions and permissions concerning using their local street.

将来 Moving forward

XII. 整備された路上活動（プレイストリートなど）は、人々の考え方にどのような変化を与えますか。
How do organised street activities such as playstreet change people's views towards street as an open space?

XIII. どのようにすれば近所の道路を通るだけではなく都市オープンスペースとして回復できると思いますか？
How can we re-establish the street as an urban open space and not merely a place for passing?）

XIV. ここまでの話から日本の近隣の道路の未来はどうなると思いますか？
In view of the issues we have discussed, what do you think is the general future of neighbourhood streets in Japan?

ご協力お願いします

Appendix 5: Notes for Chapter 7

*1) Obachanchi is a Non-profit Organization (NPO) based in Shinagawa that supports activities that encourage children to come out and play in open spaces such as streets and adventure playgrounds, as well as engage in intergenerational communication. The name "Obachanchi" means "Aunt's house" and refers to the kind environment of rearing children in community.

*2) Nagashi somen: people pick and eat noodles flowing in bamboo cross-sections assembled along the Tokkaido Street in Shinagawa. It is a summer traditional activity enjoyed in other places throughout summer and provides an opportunity for community bonding.

*3) Sakada: leader in neighborhood association in the 40s age-group. He has 7 years as play leader with children on Aisome-dori street; overseeing mobile play truck event and screening of movies on the street. He offered many insights regarding community relations during carfree activities. The interview was conducted on July 29th for 1 hour and 14 minutes

*4) Haruko: Organizes tea ceremonies and other street activities outside her office along Tokkaido Street She is 40s age-group and trained as an Architect & Urban Planner. Also, a member of shopping street association. She particularly explained the role of shopping street associations in street activities, and the process of preparing activities on Tokkaido. The interview was conducted on August 11th for 1 hour and 13 minutes.

*5) Yukihiro: Urban Planner and Professor. Expert in soft mobility and development of cars that can mingle safely with pedestrians. First involved in making a carfree street in 1969. Due to his age and experience, he was instrumental in explaining the evolution of street spaces in Japan from the 1960s when cars began to increase rapidly. The interview was conducted on June 29th for 1 hour.

*6) Komura: 34 years in Urban Planning, 14 years in redevelopment of areas with Roji (narrow alleys). Leader of Roji Association. The interview was conducted on July 6th for 1 hour and 22 minutes.

*7) Kita: Urban Planner and Associate Professor. Researcher on parklets. 20 years of experience in urban planning. The interview was conducted on July 4th for 1 hour and 46 minutes.

*8) Mura: Works for NPO helping groups to organize play activities such as playstreet for the last two years. Play leader for playstreet for 10 years. The interview was conducted on August 3rd for 1 hour and 54 minutes.

*9) Ryuu: Expert in Area Management and Real Estate. Assistant Professor. Organiser of parklets to enhance human scale on streets on weekends. The interview was conducted on July 9th for 1 hour and 25 minutes.

*10) Misato: Expert in Child-friendly cities, and leader of children's NPO. Ninja training for children on Tokkaido Street. Office along same street. His experience growing up in Shinagawa offered special insights on how the Tokkaido street has been changing with regards to children. The interview was conducted on July 8th for 35 minutes.

*11) Road traffic act: The Road Traffic ACT OF 1960. Limits use of street for mobility even in neighborhoods. Empowers police to control and give permission for other activities on streets.

*12) Yumiko: Organizer of street play, Halloween Parade and Ninja Play on Tokkaido Street; office located along same Street. Native of Shinagawa. The interview was conducted on July 7th for 1 hour and 3 minutes.

*13) Taku: Works for NPO helping groups shopping street associations to organize play activities for the last two years. The interview was conducted on July 21st for 34 minutes.

*14) Mia: has been organizing open markets for six years. Also, an architect of 12 years with experience abroad. Interview was conducted on October 30th for 43 minutes.

*15) Hiro: Retired professor with over 50 years of urban Planning in Japan. He was instrumental in explaining the rigidity of planning approaches. Also, a researcher on narrow alleys with experience abroad. Interview was conducted on July 20th for 1 hour.